

REVISED VERSION

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
8 March 2001 (08.03.2001)

PCT

(10) International Publication Number
WO 01/16850 A2

(51) International Patent Classification⁷: G06F 17/60

(21) International Application Number: PCT/US00/24289

(22) International Filing Date: 31 August 2000 (31.08.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/386,897 31 August 1999 (31.08.1999) US

(71) Applicant: ACCENTURE LLP [US/US]; 1661 Page Mill Road, Palo Alto, CA 94304 (US).

(72) Inventor: CAMPBELL, Harold; 215 Hillcrest Avenue #E-2, Decatur, GA 30030-2006 (US).

(74) Agents: HICKMAN, Paul, L. et al.; Oppenheimer Wolff & Donnelly LLP, 38th Floor, 2029 century Park East, Los Angeles, CA 90067-3024 (US).

(81) Designated States (national): AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE,

DK, DZ, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— with declaration under Article 17(2)(a); without abstract; title not checked by the International Searching Authority

(48) Date of publication of this revised version:
22 November 2001

(15) Information about Correction:
see PCT Gazette No. 47/2001 of 22 November 2001, Section II

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: A SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR ORGANIZING AND MANAGING TRANSACTION-RELATED TAX INFORMATION

(57) Abstract:



WO 01/16850 A2

PATENT COOPERATION TREATY

PCT


DECLARATION OF NON-ESTABLISHMENT OF INTERNATIONAL SEARCH REPORT

(PCT Article 17(2)(a), Rules 13ter.1(c) and Rule 39)

Applicant's or agent's file reference AND1P149.P	IMPORTANT DECLARATION	Date of mailing(day/month/year) 16/07/2001
International application No. PCT/US 00/ 24289	International filing date(day/month/year) 31/08/2000	(Earliest) Priority date(day/month/year) 31/08/1999
International Patent Classification (IPC) or both national classification and IPC G06F17/60		
Applicant ANDERSEN CONSULTING, LLP		

This International Searching Authority hereby declares, according to Article 17(2)(a), that **no international search report will be established** on the international application for the reasons indicated below

1. ☒ The subject matter of the international application relates to:
- a. ☐ scientific theories.
 - b. ☐ mathematical theories
 - c. ☐ plant varieties.
 - d. ☐ animal varieties.
 - e. ☐ essentially biological processes for the production of plants and animals, other than microbiological processes and the products of such processes.
 - f. ☒ schemes, rules or methods of doing business.
 - g. ☐ schemes, rules or methods of performing purely mental acts.
 - h. ☐ schemes, rules or methods of playing games.
 - i. ☐ methods for treatment of the human body by surgery or therapy.
 - j. ☐ methods for treatment of the animal body by surgery or therapy.
 - k. ☐ diagnostic methods practised on the human or animal body.
 - l. ☐ mere presentations of information.
 - m. ☐ computer programs for which this International Searching Authority is not equipped to search prior art.
2. ☐ The failure of the following parts of the international application to comply with prescribed requirements prevents a meaningful search from being carried out:
- ☐ the description ☐ the claims ☐ the drawings
3. ☐ The failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions prevents a meaningful search from being carried out:
- ☐ the written form has not been furnished or does not comply with the standard.
- ☐ the computer readable form has not been furnished or does not comply with the standard.
4. Further comments:

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Mar'a Rodr'guez N'voa
--	--

Form PCT/ISA/203 (July 1998)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 203

The subject-matter claimed in claims 1-6 falls under the provisions of Article 17(2)(a)(i) and Rule 39.1(iii), PCT, such subject-matter relating to a method of doing business.

Claims 7-18 relate to a conventional system for performing the business method of claims 1-6. Although these claims do not literally belong to the method category, they essentially claim protection for the same commercial effect as the method claims. The International Searching Authority considers that searching this subject-matter would serve no useful purpose. It is not at present apparent how the subject-matter of the present claims may be considered defensible in any subsequent examination phase in front of the EPO as International Preliminary Examining Authority with regard to the provisions of Article 33(1) PCT (novelty, inventive step); see also Guidelines B-VII, 1-6).

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
8 March 2001 (08.03.2001)

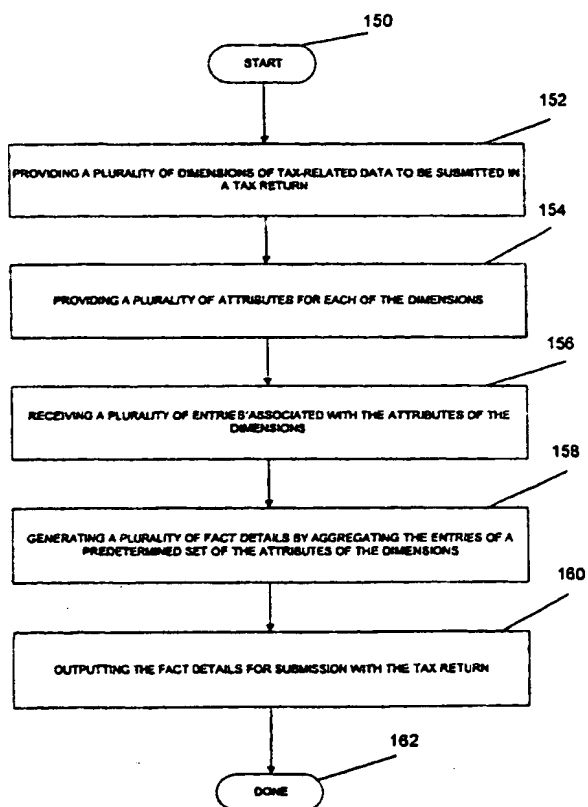
PCT

(10) International Publication Number
WO 01/16850 A2

- (51) International Patent Classification⁷: G06F 17/60
- (21) International Application Number: PCT/US00/24289
- (22) International Filing Date: 31 August 2000 (31.08.2000)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
09/386,897 31 August 1999 (31.08.1999) US
- (71) Applicant: ANDERSEN CONSULTING, LLP
[US/US]; 1661 Page Mill Road, Palo Alto, CA 94304 (US).
- (72) Inventor: CAMPBELL, Harold; 215 Hillcrest Avenue
#E-2, Decatur, GA 30030-2006 (US).
- (74) Agent: HICKMAN, Paul, L.; Hickman Coleman & Hughes, LLP, P.O. Box 52037, Palo Alto, CA 94303 (US).
- (81) Designated States (*national*): AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DZ, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: A SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR ORGANIZING AND MANAGING TRANSACTION-RELATED TAX INFORMATION



(57) Abstract: A system, method, and article of manufacture are provided for organizing a transaction-related dimension of tax-related data for generating fact details to facilitate payment of taxes. First, a transaction-related dimension of tax-related data is provided along with a plurality of attributes for the transaction-related dimension. Such attributes include a transaction line item determined based on a transaction identifier, a transaction type, a tax type, a customer account identifier, a sold to location geographic code, a ship to location geographic code, a contract number, a purchase order number, a vendor account identifier, and a vendor zip code. Next, a plurality of entries are received which are associated with the attributes of the transaction-related dimension. A plurality of fact details are then generated using the entries of a predetermined set of the attributes of the transaction-related dimension. Thereafter, the fact details are outputted.

WO 01/16850 A2



Published:

— Without international search report and to be republished upon receipt of that report.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A SYSTEM, METHOD AND ARTICLE OF MANUFACTURE FOR ORGANIZING AND MANAGING TRANSACTION-RELATED TAX INFORMATION

5

FIELD OF INVENTION

10 The present invention relates to tax-related software and more particularly to managing and organizing tax-related details in a database for effective input and retrieval.

BACKGROUND OF INVENTION

15

Numerous systems have been developed to automate financial record keeping for the purpose of tracking expense related items, income, assets, and/or liabilities, for budgetary or tax purposes. Nevertheless, although attractive in theory, most conventional systems are impractical for effective use. In most cases, one cannot afford to hire a bookkeeper to gather the necessary data, and even though a number of commercial accounting programs are available which can be run by an individual with no special training on a personal home computer, most individuals do not have the time or desire to run such programs, which inevitably require the individual to manually enter the necessary data into the computer each time a transaction, i.e., the writing of a check or deposit slip, is carried out, or to scan prerecorded forms, which must be specially prepared and compared with the original checks or deposit slips to ensure accuracy.

25

Numerous entities have finances which would benefit from automation, especially for budget planning or tax purposes, but the automation is useless if it requires generation of additional forms, manual verification and/or manual data entry. The simplest investments, such as a rental property or the purchase of ordinary common stocks, can generate an overwhelming amount of transaction data. Nevertheless, even the most user-friendly home accounting and tax preparation programs tend to end up on the shelf when the user discovers the effort needed to enter transaction data every time a cancelled check is returned or a deposit is made. Even where the

bank makes available electronic or optically scannable records which can be entered in the home accounting program, the time necessary to verify the data often negates the time saved by automated entry. Despite the best of intentions, the cancelled checks and other documents concerning the transaction thus often end up in a "shoe box" until they are needed, for example, for taxes, or for an unforeseen crisis such as a divorce or bankruptcy, by which time the individual's records can at best be only partially reconstructed and at great difficulty. While such a possibility should motivate individuals to keep better records, especially in view of the currently available technology for that purpose, it simply does not.

SUMMARY OF INVENTION

5 A system, method, and article of manufacture are provided for organizing an transaction-related dimension of tax-related data for generating fact details to facilitate payment of taxes. First, an transaction-related dimension of tax-related data is provided along with a plurality of attributes for the transaction-related dimension. Such attributes include a transaction line item determined based on a transaction identifier, a transaction type, a tax type, a customer account identifier, a sold to location geographic code, a ship to location geographic code, a contract number, a
10 purchase order number, a vendor account identifier, and a vendor zip code. Next, a plurality of entries are received which are associated with the attributes of the transaction-related dimension. A plurality of fact details are then generated using the entries of a predetermined set of the attributes of the transaction-related dimension. Thereafter, the fact details are outputted.

15 In one aspect of the present invention, the transaction line item is further determined based on a transaction description and a contract type.

In another aspect of the present invention, the dimensions may include asset, date, entity, jurisdiction, tax classification, and/or transaction dimensions. Further, the fact details may
20 include an adjusted book fact, a tax adjustment fact, a schedule M fact, a tax return fact, an apportionment fact, a line item fact, a transaction fact, an invoice fact, an asset fact, a payroll fact, a taxes paid fact, and/or a projected financial fact.

BRIEF DESCRIPTION OF DRAWINGS

The invention will be better understood when consideration is given to the following detailed description thereof. Such description makes reference to the annexed drawings wherein:

Figure 1 is a schematic diagram of a hardware implementation of one embodiment of the present invention;

Figure 1a is a flowchart depicting the various steps of one embodiment of the present invention.

Figure 2 is an illustration showing various dimensions of tax-related data which together comprise a plurality of fact groups in accordance with one embodiment of the present invention;

Figure 3 is an illustration showing various examples of attributes associated with the asset dimension in accordance with one embodiment of the present invention;

Figure 4 is an illustration showing various examples of attributes associated with the date dimension in accordance with one embodiment of the present invention;

Figure 5 is an illustration showing various examples of attributes associated with the entity dimension in accordance with one embodiment of the present invention;

Figure 6 is an illustration showing various examples of attributes associated with the jurisdiction dimension in accordance with one embodiment of the present invention;

Figure 7 is an illustration showing various examples of attributes associated with the tax classification dimension in accordance with one embodiment of the present invention;

Figure 8 is an illustration showing various examples of attributes associated with the transaction dimension in accordance with one embodiment of the present invention;

Figure 9 is an illustration showing a set of the attributes associated with the adjusted book fact in accordance with one embodiment of the present invention;

Figure 10 is an illustration showing a set of the attributes associated with the tax adjustment fact in accordance with one embodiment of the present invention;

Figure 11 is an illustration showing a set of the attributes associated with the schedule M fact in accordance with one embodiment of the present invention;

5

Figure 12 is an illustration showing a set of the attributes associated with the tax return fact in accordance with one embodiment of the present invention;

Figure 13 is an illustration showing a set of the attributes associated with the apportionment fact in accordance with one embodiment of the present invention;

10

Figure 14 is an illustration showing a set of the attributes associated with the line item fact in accordance with one embodiment of the present invention;

Figure 15 is an illustration showing a set of the attributes associated with the transaction amount fact in accordance with one embodiment of the present invention;

15

Figure 16 is an illustration showing a set of the attributes associated with the invoice fact in accordance with one embodiment of the present invention;

20

Figure 17 is an illustration showing a set of the attributes associated with the asset fact in accordance with one embodiment of the present invention;

Figure 18 is an illustration showing a set of the attributes associated with the payroll amount fact in accordance with one embodiment of the present invention;

25

Figure 19 is an illustration showing a set of the attributes associated with the taxes paid fact in accordance with one embodiment of the present invention; and

Figure 20 is an illustration showing a set of the attributes associated with the projected financials fact in accordance with one embodiment of the present invention.

30

DISCLOSURE OF INVENTION

The present invention is provided for organizing multiple dimensions of tax-related data for generating fact details to facilitate payment of taxes. In order to accomplish this, one embodiment of the present invention is practiced in the context of a personal computer such as an IBM compatible personal computer, Apple Macintosh computer or UNIX based workstation.

A representative hardware environment is depicted in Figure 1, which illustrates a typical hardware configuration of a workstation in accordance with a preferred embodiment having a central processing unit 110, such as a microprocessor, and a number of other units interconnected via a system bus 112. The workstation shown in Figure 1 includes a Random Access Memory (RAM) 114, Read Only Memory (ROM) 116, an I/O adapter 118 for connecting peripheral devices such as disk storage units 120 to the bus 112, a user interface adapter 122 for connecting a keyboard 124, a mouse 126, a speaker 128, a microphone 132, and/or other user interface devices such as a touch screen (not shown) to the bus 112, communication adapter 134 for connecting the workstation to a communication network (e.g., a data processing network) and a display adapter 136 for connecting the bus 112 to a display device 138.

The workstation typically has resident thereon an operating system such as the Microsoft Windows NT or Windows/95 Operating System (OS), the IBM OS/2 operating system, the MAC OS, or UNIX operating system. Those skilled in the art will appreciate that the present invention may also be implemented on platforms and operating systems other than those mentioned.

Operating on the hardware is software. One embodiment of software is written using JAVA, C, and the C++ language and utilizes object oriented programming methodology. Object oriented programming (OOP) has become increasingly used to develop complex applications. As OOP moves toward the mainstream of software design and development, various software solutions require adaptation to make use of the benefits of OOP. A need exists for these principles of OOP to be applied to a messaging interface of an electronic messaging system such that a set of OOP classes and objects for the messaging interface can be provided.

OOP is a process of developing computer software using objects, including the steps of analyzing the problem, designing the system, and constructing the program. An object is a software package that contains both data and a collection of related structures and procedures. Since it contains both data and a collection of structures and procedures, it can be visualized as a self-sufficient component that does not require other additional structures, procedures or data to perform its specific task. OOP, therefore, views a computer program as a collection of largely autonomous components, called objects, each of which is responsible for a specific task. This concept of packaging data, structures, and procedures together in one component or module is called encapsulation.

In general, OOP components are reusable software modules which present an interface that conforms to an object model and which are accessed at run-time through a component integration architecture. A component integration architecture is a set of architecture mechanisms which allow software modules in different process spaces to utilize each others capabilities or functions. This is generally done by assuming a common component object model on which to build the architecture. It is worthwhile to differentiate between an object and a class of objects at this point. An object is a single instance of the class of objects, which is often just called a class. A class of objects can be viewed as a blueprint, from which many objects can be formed.

OOP allows the programmer to create an object that is a part of another object. For example, the object representing a piston engine is said to have a composition-relationship with the object representing a piston. In reality, a piston engine comprises a piston, valves and many other components; the fact that a piston is an element of a piston engine can be logically and semantically represented in OOP by two objects.

OOP also allows creation of an object that "depends from" another object. If there are two objects, one representing a piston engine and the other representing a piston engine wherein the piston is made of ceramic, then the relationship between the two objects is not that of composition. A ceramic piston engine does not make up a piston engine. Rather it is merely one kind of piston engine that has one more limitation than the piston engine; its piston is made of ceramic. In this case, the object representing the ceramic piston engine is called a derived object, and it inherits all of the aspects of the object representing the piston engine and adds further

limitation or detail to it. The object representing the ceramic piston engine “depends from” the object representing the piston engine. The relationship between these objects is called inheritance.

- 5 When the object or class representing the ceramic piston engine inherits all of the aspects of the objects representing the piston engine, it inherits the thermal characteristics of a standard piston defined in the piston engine class. However, the ceramic piston engine object overrides these ceramic specific thermal characteristics, which are typically different from those associated with a metal piston. It skips over the original and uses new functions related to ceramic pistons.
- 10 Different kinds of piston engines have different characteristics, but may have the same underlying functions associated with it (e.g., how many pistons in the engine, ignition sequences, lubrication, etc.). To access each of these functions in any piston engine object, a programmer would call the same functions with the same names, but each type of piston engine may have different/overriding implementations of functions behind the same name. This ability to hide
- 15 different implementations of a function behind the same name is called polymorphism and it greatly simplifies communication among objects.

With the concepts of composition-relationship, encapsulation, inheritance and polymorphism, an object can represent just about anything in the real world. In fact, our logical perception of the reality is the only limit on determining the kinds of things that can become objects in object-oriented software. Some typical categories are as follows:

20

- Objects can represent physical objects, such as automobiles in a traffic-flow simulation, electrical components in a circuit-design program, countries in an economics model, or aircraft in an air-traffic-control system.
- 25 • Objects can represent elements of the computer-user environment such as windows, menus or graphics objects.
- An object can represent an inventory, such as a personnel file or a table of the latitudes and longitudes of cities.
- An object can represent user-defined data types such as time, angles, and complex
- 30 numbers, or points on the plane.

With this enormous capability of an object to represent just about any logically separable matters, OOP allows the software developer to design and implement a computer program that is

a model of some aspects of reality, whether that reality is a physical entity, a process, a system, or a composition of matter. Since the object can represent anything, the software developer can create an object which can be used as a component in a larger software project in the future.

5 If 90% of a new OOP software program consists of proven, existing components made from preexisting reusable objects, then only the remaining 10% of the new software project has to be written and tested from scratch. Since 90% already came from an inventory of extensively tested reusable objects, the potential domain from which an error could originate is 10% of the program. As a result, OOP enables software developers to build objects out of other, previously
10 built objects.

This process closely resembles complex machinery being built out of assemblies and sub-assemblies. OOP technology, therefore, makes software engineering more like hardware engineering in that software is built from existing components, which are available to the
15 developer as objects. All this adds up to an improved quality of the software as well as an increased speed of its development.

Programming languages are beginning to fully support the OOP principles, such as encapsulation, inheritance, polymorphism, and composition-relationship. With the advent of the
20 C++ language, many commercial software developers have embraced OOP. C++ is an OOP language that offers a fast, machine-executable code. Furthermore, C++ is suitable for both commercial-application and systems-programming projects. For now, C++ appears to be the most popular choice among many OOP programmers, but there is a host of other OOP languages, such as Smalltalk, Common Lisp Object System (CLOS), and Eiffel. Additionally,
25 OOP capabilities are being added to more traditional popular computer programming languages such as Pascal.

The benefits of object classes can be summarized, as follows:

- Objects and their corresponding classes break down complex programming problems into
30 many smaller, simpler problems.
- Encapsulation enforces data abstraction through the organization of data into small, independent objects that can communicate with each other. Encapsulation protects the

data in an object from accidental damage, but allows other objects to interact with that data by calling the object's member functions and structures.

- Subclassing and inheritance make it possible to extend and modify objects through deriving new kinds of objects from the standard classes available in the system. Thus, new capabilities are created without having to start from scratch.
- Polymorphism and multiple inheritance make it possible for different programmers to mix and match characteristics of many different classes and create specialized objects that can still work with related objects in predictable ways.
- Class hierarchies and containment hierarchies provide a flexible mechanism for modeling real-world objects and the relationships among them.
- Libraries of reusable classes are useful in many situations, but they also have some limitations. For example:
 - Complexity. In a complex system, the class hierarchies for related classes can become extremely confusing, with many dozens or even hundreds of classes.
 - Flow of control. A program written with the aid of class libraries is still responsible for the flow of control (i.e., it must control the interactions among all the objects created from a particular library). The programmer has to decide which functions to call at what times for which kinds of objects.
 - Duplication of effort. Although class libraries allow programmers to use and reuse many small pieces of code, each programmer puts those pieces together in a different way. Two different programmers can use the same set of class libraries to write two programs that do exactly the same thing but whose internal structure (i.e., design) may be quite different, depending on hundreds of small decisions each programmer makes along the way. Inevitably, similar pieces of code end up doing similar things in slightly different ways and do not work as well together as they should.

Class libraries are very flexible. As programs grow more complex, more programmers are forced to reinvent basic solutions to basic problems over and over again. A relatively new extension of the class library concept is to have a framework of class libraries. This framework is more complex and consists of significant collections of collaborating classes that capture both the small scale patterns and major mechanisms that implement the common requirements and design in a specific application domain. They were first developed to free application

programmers from the chores involved in displaying menus, windows, dialog boxes, and other standard user interface elements for personal computers.

5 Frameworks also represent a change in the way programmers think about the interaction between the code they write and code written by others. In the early days of procedural programming, the programmer called libraries provided by the operating system to perform certain tasks, but basically the program executed down the page from start to finish, and the programmer was solely responsible for the flow of control. This was appropriate for printing out paychecks, calculating a mathematical table, or solving other problems with a program that executed in just
10 one way.

The development of graphical user interfaces began to turn this procedural programming arrangement inside out. These interfaces allow the user, rather than program logic, to drive the program and decide when certain actions should be performed. Today, most personal computer
15 software accomplishes this by means of an event loop which monitors the mouse, keyboard, and other sources of external events and calls the appropriate parts of the programmer's code according to actions that the user performs. The programmer no longer determines the order in which events occur. Instead, a program is divided into separate pieces that are called at unpredictable times and in an unpredictable order. By relinquishing control in this way to users,
20 the developer creates a program that is much easier to use. Nevertheless, individual pieces of the program written by the developer still call libraries provided by the operating system to accomplish certain tasks, and the programmer must still determine the flow of control within each piece after it's called by the event loop. Application code still "sits on top of" the system.

25 Even event loop programs require programmers to write a lot of code that should not need to be written separately for every application. The concept of an application framework carries the event loop concept further. Instead of dealing with all the nuts and bolts of constructing basic menus, windows, and dialog boxes and then making these things all work together, programmers using application frameworks start with working application code and basic user interface
30 elements in place. Subsequently, they build from there by replacing some of the generic capabilities of the framework with the specific capabilities of the intended application.

Application frameworks reduce the total amount of code that a programmer has to write from scratch. However, because the framework is really a generic application that displays windows, supports copy and paste, and so on, the programmer can also relinquish control to a greater degree than event loop programs permit. The framework code takes care of almost all event handling and flow of control, and the programmer's code is called only when the framework needs it (e.g., to create or manipulate a proprietary data structure).

A programmer writing a framework program not only relinquishes control to the user (as is also true for event loop programs), but also relinquishes the detailed flow of control within the program to the framework. This approach allows the creation of more complex systems that work together in interesting ways, as opposed to isolated programs, having custom code, being created over and over again for similar problems.

Thus, as is explained above, a framework basically is a collection of cooperating classes that make up a reusable design solution for a given problem domain. It typically includes objects that provide default behavior (e.g., for menus and windows), and programmers use it by inheriting some of that default behavior and overriding other behavior so that the framework calls application code at the appropriate times.

There are three main differences between frameworks and class libraries:

- Behavior versus protocol. Class libraries are essentially collections of behaviors that you can call when you want those individual behaviors in your program. A framework, on the other hand, provides not only behavior but also the protocol or set of rules that govern the ways in which behaviors can be combined, including rules for what a programmer is supposed to provide versus what the framework provides.
- Call versus override. With a class library, the code the programmer instantiates objects and calls their member functions. It's possible to instantiate and call objects in the same way with a framework (i.e., to treat the framework as a class library), but to take full advantage of a framework's reusable design, a programmer typically writes code that overrides and is called by the framework. The framework manages the flow of control among its objects. Writing a program involves dividing responsibilities among the various pieces of software that are called by the framework rather than specifying how the different pieces should work together.

- Implementation versus design. With class libraries, programmers reuse only implementations, whereas with frameworks, they reuse design. A framework embodies the way a family of related programs or pieces of software work. It represents a generic design solution that can be adapted to a variety of specific problems in a given domain.
5 For example, a single framework can embody the way a user interface works, even though two different user interfaces created with the same framework might solve quite different interface problems.

Thus, through the development of frameworks for solutions to various problems and
10 programming tasks, significant reductions in the design and development effort for software can be achieved. A preferred embodiment of the invention utilizes HyperText Markup Language (HTML) to implement documents on the Internet together with a general-purpose secure communication protocol for a transport medium between the client and the Newco. HTTP or other protocols could be readily substituted for HTML without undue experimentation.

15 Information on these products is available in T. Berners-Lee, D. Connolly, "RFC 1866: Hypertext Markup Language - 2.0" (Nov. 1995); and R. Fielding, H. Frystyk, T. Berners-Lee, J. Gettys and J.C. Mogul, "Hypertext Transfer Protocol -- HTTP/1.1: HTTP Working Group Internet Draft" (May 2, 1996). HTML is a simple data format used to create hypertext documents that are portable from one platform to another. HTML documents are SGML documents with generic
20 semantics that are appropriate for representing information from a wide range of domains. HTML has been in use by the World-Wide Web global information initiative since 1990. HTML is an application of ISO Standard 8879; 1986 Information Processing Text and Office Systems; Standard Generalized Markup Language (SGML).

25 To date, Web development tools have been limited in their ability to create dynamic Web applications which span from client to server and interoperate with existing computing resources. Until recently, HTML has been the dominant technology used in development of Web-based solutions. However, HTML has proven to be inadequate in the following areas:

- Poor performance;
- 30 • Restricted user interface capabilities;
- Can only produce static Web pages;
- Lack of interoperability with existing applications and data; and
- Inability to scale.

Sun Microsystem's Java language solves many of the client-side problems by:

Improving performance on the client side;

Enabling the creation of dynamic, real-time Web applications; and

- 5 • Providing the ability to create a wide variety of user interface components.

With Java, developers can create robust User Interface (UI) components. Custom "widgets" (e.g., real-time stock tickers, animated icons, etc.) can be created, and client-side performance is improved. Unlike HTML, Java supports the notion of client-side validation, offloading
10 appropriate processing onto the client for improved performance. Dynamic, real-time Web pages can be created. Using the above-mentioned custom UI components, dynamic Web pages can also be created.

Sun's Java language has emerged as an industry-recognized language for "programming the
15 Internet." Sun defines Java as: "a simple, object-oriented, distributed, interpreted, robust, secure, architecture-neutral, portable, high-performance, multithreaded, dynamic, buzzword-compliant, general-purpose programming language. Java supports programming for the Internet in the form of platform-independent Java applets." Java applets are small, specialized applications that comply with Sun's Java Application Programming Interface (API) allowing
20 developers to add "interactive content" to Web documents (e.g., simple animations, page adornments, basic games, etc.). Applets execute within a Java-compatible browser (e.g., Netscape Navigator) by copying code from the server to client. From a language standpoint, Java's core feature set is based on C++. Sun's Java literature states that Java is basically, "C++ with extensions from Objective C for more dynamic method resolution."

25 Another technology that provides similar function to JAVA is provided by Microsoft and ActiveX Technologies, to give developers and Web designers wherewithal to build dynamic content for the Internet and personal computers. ActiveX includes tools for developing animation, 3-D virtual reality, video and other multimedia content. The tools use Internet
30 standards, work on multiple platforms, and are being supported by over 100 companies. The group's building blocks are called ActiveX Controls, small, fast components that enable developers to embed parts of software in hypertext markup language (HTML) pages. ActiveX Controls work with a variety of programming languages including Microsoft Visual C++,

Borland Delphi, Microsoft Visual Basic programming system and, in the future, Microsoft's development tool for Java, code named "Jakarta." ActiveX Technologies also includes ActiveX Server Framework, allowing developers to create server applications. One of ordinary skill in the art readily recognizes that ActiveX could be substituted for JAVA without undue experimentation to practice the invention.

Figure 1A is a flowchart illustrating the various operations of the present invention that may be carried out by the hardware and software tools set forth hereinabove. In the most general terms, the process begins in operation 150. Next, a plurality of dimensions of tax-related data to be submitted in a tax return are provided along with a plurality of attributes for each of the dimensions. See operation 152 and 154, respectively. The dimensions include information pertinent to the calculation of tax liability. Such information includes tax classification and entity type. This information may be further classified in the various attributes of the dimensions.

With continuing reference to Figure 1A, and in particular operation 156, a plurality of entries are shown to be received which are associated with the attributes of the dimensions. A plurality of fact details are then generated by aggregating the entries of a predetermined set of the attributes of some or all of the dimensions, as indicated in operation 158. Thereafter, in operation 160 the fact details are outputted for various reason such as submission with the tax return after which the process is terminated in operation 162.

It should be noted that the dimensions, attributes, and entries may be inputted by any input device such as the keyboard 124, the mouse 126, the microphone 132, the touch screen (not shown), or anything else that is capable of conveying such information. As an option, the dimensions attributes need only be entered initially once, or simply provided.

Further, the generation of the fact details may be carried out via the CPU 110 which in turn may be governed by a computer program stored on a computer readable medium, i.e. the RAM 114, ROM 116, the disk storage units 120, and/or anything else capable of storing the computer program. In the alternative, dedicated hardware such as an application specific integrated circuit (ASIC) may be employed to accomplish the same.

In order to generate the fact details, a computer program, or any other type of logic, is adapted to use different sets of the attributes of some or all of the dimensions for calculation of each of the various fact details. Upon the appropriate selection of attributes that are applicable to the calculation of the fact detail at hand, the fact detail may be calculated using equations and rules set forth by the desired tax preparation practice. In the alternative, such calculation of the fact details may be carried out manually, thereby using the present invention primarily for the collection, organization, and convenient access to the tax-related data.

The outputting of the fact details may be effected by way of the display 138, the speaker 128, a printer (not shown) or any other output mechanism capable of delivering the results to the user. It should be understood that the foregoing components need not be resident on a single computer, but also may be a component of either a networked client and/or a server.

In use, the system may be capable of supporting data requirements for federal and state income tax filing; supporting the analysis of foreign sale corporation activity on a transaction-by-transaction basis, storing and retrieving transaction data to support federal income tax information document requests, analyzing sales and using tax refund opportunities, comparing specific valuation bases for property tax reporting, supplying financial data on a jurisdictional basis to support state and local credit and incentives analysis, and storing and retrieving data related to income projection and schedule M reversals to support deferred planning. The present invention may thus include an API which can handle any tax-related matter including those listed above, and may further be capable of allowing convenient retrieval and input of tax-related fact details through an automated organization method which will soon be set forth.

In one embodiment of the present invention, a description may be provided for each of the attributes, dimensions, and fact details. Such description may facilitate the inputting of the entries or serve to explain the generated fact details.

Dimensions & Attributes

In one embodiment of the present invention, the dimensions may include asset 200, date 202, entity 204, jurisdiction 206, tax classification 208, and/or transaction 210 dimensions. Note

Figure 2 as well as the following table, which lists and describes each of the dimensions found in Figure 2 and used for generation of fact details.

Dimension Name	Dimension Description
Asset	Contains all of the attributes associated with an asset.
Date	Contains attributes about the time when an activity occurred.
Entity	Contains all the attributes associated with a legal entity.
Jurisdiction	Contains all the attributes of the taxing jurisdiction.
Tax Classification	Represents the categories by which information is reported on various returns.
Transaction	Contains all the attributes of all source systems from which information was imported.

5

Various attributes of the asset dimension **200** of the tax-related data are shown in Figure 3. The following table lists each attribute of the asset dimension **200** shown in Figure 3 and its exemplary description. Also included are sample entries that are used for, for example, calculating fact details and tax cost or identifying a particular asset.

10

Attribute Name	Attribute Description	Sample Values
Asset ID	Represents a unique identifier assigned to individual assets in the property subsystem.	1234
Asset Category	Represents the category of assets in the property subsystem.	Vehicles
Asset Description	Represents more detail on individual asset in the property subsystem.	1997 Chevy Truck
Asset Status	Identifies the condition of each asset.	New, used, obsolete

Attribute Name	Attribute Description	Sample Values
Calendar Date Asset Placed In Service	Identifies the date an individual asset was placed in service	1/1/99
Calendar Date Acquired	Identifies the date an individual asset was acquired	1/1/99
Fiscal Date Asset Placed In Service	Identifies the fiscal date an individual asset was placed in service	F 1/1/99
Fiscal Date Acquired	Identifies the fiscal date an individual asset was acquired	F 1/1/99
Book Life	Identifies the number of years the individual asset is depreciated for financial purposes.	7 years
Book Depreciation Method	Identifies the method used to depreciate the individual asset for financial purposes.	Straight-line
Tax Life	Identifies the number of years the individual asset is depreciated for tax purposes.	3 years
Tax Depreciation Method	Identifies the method used to depreciate the individual asset for tax purposes.	Modified Accelerated Cost Recovery System (MACRS)
Allocated Activity	Represents the method used to track activity / usage on asset.	Miles per vehicle per state, days in state

Various attributes of the date dimension 202 of the tax-related data are shown in Figure 4 and further characterized as follows (*shaded areas show future attributes):

5

Attribute Name	Attribute Description	Sample Values
Date	The specific day that a transaction	2/28/1998

Attribute Name	Attribute Description	Sample Values
	/ activity took place.	
Calendar Week	The calendar week.	Week 1 1999
Calendar Month	The calendar month.	January, 1998
Calendar Quarter	The calendar quarter.	1998Q1
Calendar Year	The calendar year.	1998
Fiscal Week	The week that represents the corporate calendar. Note that the F in the data value indicates that this is a fiscal time period.	F Week 1 1999 F Week 46 1999
Fiscal Month	The fiscal period comprised of 4 or 5 weeks. Note that the F in the data value indicates that this is a fiscal time period.	F January, 1998
Fiscal Quarter	The grouping of 3 fiscal months.	F 1998Q1
Fiscal Year	The grouping of 52 fiscal weeks / 12 fiscal months that comprise the financial year.	F 1998
Filing Date	The actual date the return was filed.	5/15/1998

Various attributes of the entity dimension 204 of the tax-related data are shown in Figure 5 and further characterized as follows:

5

Attribute Name	Attribute Description	Sample Values
Cost Center	Indicates a specific cost center that has a budget. This is the lowest level of the corporate organizational structure.	Sales
Consolidated Group	Represents the companies, which are grouped together for reporting	North America

Attribute Name	Attribute Description	Sample Values
	purposes.	
Company	Represents the different companies as separate legal entities.	XYZ, Inc.
Company code	Represents the company's unique internal numeric identifier.	ABC12345
Taxpayer ID	Represents the legal entity's unique 9 digit tax identification #.	74-1751406
Date of incorporation	Represents the legal entity's date of incorporation.	January 1, 1998
Place of incorporation	Represents where legal entity was incorporated.	Texas
Division	Major operating areas of the company.	Commercial Services
Region	Business units that are grouped geographically for field organization and home office by functional area.	Midwest
Business Unit	A grouping of cost centers.	Greater Chicago

Various attributes of the jurisdiction dimension 206 of the tax-related data are shown in Figure 6 and further characterized as follows:

5

Attribute Name	Attribute Description	Sample Values
Name	Represents the name of the taxing authority.	City of Houston
Jurisdiction type	Represents the type of taxing authority.	Property, sales, etc.
Location ID	Represents a unique identifier to distinguish location at a level	Subdivide sections of a plant or facility

Attribute Name	Attribute Description	Sample Values
	below address.	- manufacturing, administrative
Geo code	Represents a unique identifier similar to zip code.	77777-12345678
School District	Represents the name of the school district / tax collector the Geo code area is responsible for remitting taxes to.	Houston I.S.D
City	Represents the name of the city where Geo code area is located.	Houston
County	Represents the name of the county where Geo code area is located.	Harris
State	Represents the name of the state where Geo code area is located.	Texas
Zip code	The 5 digit zip code where Geo code area is located.	77042
Zip code+4	The 9 digit zip code where Geo code area is located.	77042-1041
Country	Represents the name of the country where Geo code area is located.	USA

Various attributes of the tax classification dimension 208 of the tax-related data are shown in Figure 7 and further characterized as follows:

Attribute Name	Attribute Description	Sample Values
Tax Category Description	Represents the type of information reported on the return. (This attribute is meant to capture information by section on the tax form.)	Income, Expense, Tax, Credits, Assets

Attribute Name	Attribute Description	Sample Values
Tax Sub - Category Description	Represents the type of information reported on the return. (This attribute is meant to capture information by line item on the tax form.)	Sales, Cash
Account ID	Represents the GL or other account identifier. These accounts are summarized into sub-categories.	1234
Account Description	Represents the GL or other account description.	Cash - Bank One #1234
Account Group Level 3	A collection of GL Accounts as determined by finance	Employee Salary, Contract Labor
Account Group Level 2	A collection of Account Group Level 3 accounts as defined by finance	Human Resources
Account Group Level 1	A collection of Account Group Level 2 accounts as defined by finance	Legal Fees, Capital Equipment, Salary & Benefits

Various attributes of the transaction dimension 210 of the tax-related data are shown in Figure 8 and further characterized as follows:

5

Attribute Name	Attribute Description	Sample Values
Transaction ID	Identifies the document posting # in the source system.	Invoice #, Check #, Journal Entry #, Batch Posting #
Transaction Type	Identifies the document posting type in the source system.	Accruals, Sales, Payments
Transaction Description	Represents the text descriptive field for the document posting.	"To accrue Texas Franchise tax for

Attribute Name	Attribute Description	Sample Values
		the month of December 1998."
Purchase Order Number	Identifies the document posting purchase order information, if applicable.	1234
AFE Number	Identifies the document posting project number information, if applicable.	1234
SUE Type	Describes the transaction in terms to identify the taxability of the transaction. (Needed for RAM)	Maintenance, Equipment rentals, new construction, etc.
Tax Type	Identifies the type of tax accrued / paid.	sales, use, excise, property, fed income, state income, etc.
Customer Account ID	Identifies the customer (referenced in the document posting) who products / services were sold to.	XYZ, Inc.
Vendor Account ID	Identifies the vendor or payee (referenced in the document posting who payments for products / services / taxes were made to.	ABC, Inc.
Contract Number	Identifies the legal file reference #.	1234
Contract Type	Identifies the type of contract for tax purposes.	Lump sum, separated
Sold To Location Geo Code	Identifies the location of where sale / purchase originated.	77042-1041
Ship To Location	Identifies the location of where	78645-1001

Attribute Name	Attribute Description	Sample Values
Geo Code	sale / purchase was shipped / consumed.	
Line Item	Identifies the detail at a level below the total transaction or invoice.	Product, freight costs, account distribution

Fact Details

- 5 In one embodiment of the present invention, the fact details may include an adjusted book fact, a tax adjustment fact, a schedule M fact, a tax return fact, an apportionment fact, a line item fact, a transaction fact, an invoice fact, an asset fact, a payroll fact, a taxes paid fact, and/or a projected financial fact.
- 10 An example of calculation of an adjusted book fact 900 is shown in Figure 9. The dimensions necessary for the exemplary calculation of an adjusted book amount, such as of the level of an account, are shown along with a selected attribute that define the parameters of the final calculated fact. In this example, the month attribute of the date dimension is used, meaning that the level of the account at the end of the month is being calculated. The type of entity is
- 15 classified under the business unit attribute of the entity dimension. Also, the proper jurisdiction type attribute, such as property, sales, or income tax, is selected along with the jurisdiction of the taxing authority, i.e., state, federal, foreign, or special, are selected from the of the jurisdiction dimension. A particular tax sub category of the tax classification dimension is used to identify the type of information that will be reported on the return, such as for capturing information by
- 20 line item on the tax form. Examples of the tax sub category for the account in this example include sales and cash. Also, as noted in Figure 9, the transaction and asset dimensions are not used to calculate the adjusted book fact in this example.

25 The following table illustrates the fact name shown in Figure 9 as well as describes the fact and provides a default aggregation rule:

Fact Name	Fact Description	Default Aggregation Rule
Adjusted Book Amount	The dollar amount per category, subcategory, down to the account level of the final audited (adjusted book) financial statements	Business Unit

Examples of the tax adjustment facts 1000 and associated exemplary descriptions are shown in Figure 10 and further characterized as follows:

5

Fact Name	Fact Description	Default Aggregation Rule
Tax Adjustment Amount	The dollar amount per category, subcategory, down to the account level of the tax reclassifications to the adjusted book \$ for tax purposes.	Business Unit

Examples of the schedule M facts 1100 and associated exemplary descriptions are shown in Figure 11 and further characterized as follows:

10

Fact Name	Fact Description	Default Aggregation Rule
Schedule M Amount	The current years "Schedule M" book to tax reconciling items - examples include the 50 % nondeductible portion of travel & entertainment expenses, tax exempt interest income, etc.	Business Unit

Examples of the tax return facts 1200 and associated exemplary descriptions are shown in Figure 12 and further characterized as follows:

Fact Name	Fact Description	Default Aggregation Rule
Tax Return Amount	The dollar amount per category and subcategory of the items per the tax return.	Return Level

5

Examples of the tax apportionment facts 1300 and associated exemplary descriptions are shown in Figure 13 and further characterized as follows:

Fact Name	Fact Description	Default Aggregation Rule
Sales Percentage	Sales dollar amount by jurisdiction	Jurisdiction City
Property Percentage	Property dollar amount by jurisdiction	Jurisdiction City
Payroll Percentage	Payroll dollar amount by jurisdiction	Jurisdiction City
Apportionment Percentage	The result of the above three facts, weighted according to individual taxing jurisdiction parameters to determine overall tax rate applied on income tax return.	Jurisdiction City

10

Examples of the line item facts 1400 and associated exemplary descriptions are shown in Figure 14 and further characterized as follows:

Fact Name	Fact Description	Default Aggregation Rule
Line Item Amount	The dollar amount at a level lower than the total transaction, such as the distribution to other GL accounts, freight / other costs, tax paid, etc.	

Examples of the transaction facts **1500** and associated exemplary descriptions are shown in Figure 15 and further characterized as follows:

Fact Name	Fact Description	Default Aggregation Rule
Transaction Amount	The dollar amount per individual transaction document posting. This is an aggregate of line item.	Transactions will be stored at the account level. When transaction amounts are needed at the Transaction ID level, they will be derived from the Line Item Fact Table.

5

Examples of the invoice facts **1600** and associated exemplary descriptions are shown in Figure 16 and further characterized as follows:

Fact Name	Fact Description	Default Aggregation Rule
Invoice Amount	Total dollar amount of all line items on the invoice. (* For detailed line item totals see the	Summarized at the jurisdiction level

Fact Name	Fact Description	Default Aggregation Rule
	Line Item fact table with a "SUE Type" constraint within the Transaction dimension)	
Pre Tax Invoice Amount	Dollar amount of line items on the invoice, before tax is paid or accrued	Summarized at the jurisdiction level
Exemption Amount	Dollar amount of line items on the invoice which are not taxable	Summarized at the jurisdiction level
Taxes Paid	Dollar amount of taxes paid on the invoice	Summarized at the jurisdiction level
Taxes Accrued	Dollar amount of taxes accrued on the invoice, to be paid at a later date	Summarized at the jurisdiction level

Examples of the asset facts 1700 and associated exemplary descriptions are shown in Figure 17 and further characterized as follows:

5

Fact Name	Fact Description	Default Aggregation Rule
Book Basis	The dollar amount of the asset in accordance with GAAP	Summarized at the jurisdiction level
Accumulated Depreciation	The dollar amount of the book accumulated depreciation for financial purposes in accordance with GAAP	Summarized at the jurisdiction level
Assessed Value	Reflects the taxing authority's opinion of the current market value of the asset	Summarized at the jurisdiction level
Replacement Cost	The current cost to replace the asset	Summarized at the jurisdiction level

Fact Name	Fact Description	Default Aggregation Rule
Utilization Number	Reflects the actual usage/production for an asset	Summarized at the jurisdiction level
Capacity Number	Reflects 100% usage/production for an asset	Summarized at the jurisdiction level

Examples of the payroll facts 1800 and associated exemplary descriptions are shown in Figure 18 and further characterized as follows:

Fact Name	Fact Description	Default Aggregation Rule
Payroll Amount	Total amount of salaries and wages paid in a jurisdiction	Summarized at the city jurisdiction level
Employee Headcount	The number of employees in a jurisdiction	Summarized at the city jurisdiction level
Employee Days	The number of days (attendance)	Summarized at the city jurisdiction level
Officer Salaries	The amount of salaries paid to officers of the business unit within a jurisdiction	Summarized at the city jurisdiction level

5

Examples of the taxes paid facts 1900 and associated exemplary descriptions are shown in Figure 19 and further characterized as follows:

Fact Name	Fact Description	Default Aggregation Rule
Sales Tax Amount		Summarized at the city jurisdiction level

Fact Name	Fact Description	Default Aggregation Rule
Use Tax Amount		Summarized at the city jurisdiction level
Excise Tax Amount		Summarized at the city jurisdiction level
Property Tax Amount		Summarized at the city jurisdiction level
Income Tax Amount		Summarized at the city jurisdiction level
Franchise Tax Amount		Summarized at the city jurisdiction level
Other Tax Amount		Summarized at the city jurisdiction level

Examples of the projected financial facts 2000 and associated exemplary descriptions are shown in Figure 20 and further characterized as follows:

Fact Name	Fact Description	Default Aggregation Rule
Projected Book Net Income Amount	Projected income less expenses for financial purposes	Summarized at the business unit level
Projected Permanent Differences	Projected items which are to be excluded for tax purposes (505 travel & entertainment, tax exempt interest income)	Summarized at the business unit level
Projected Timing	Projected items which need to be	Summarized at the

Fact Name	Fact Description	Default Aggregation Rule
Differences	adjusted to reflect tax limitations, methods, etc. (excess contributions carryforwards, book vs. tax depreciation)	business unit level

The following are the various tiers of data within the Shared Dimensions that may be used in one implementation of the present invention. The hierarchical manner in which the data is prioritized or sorted is also illustrated.

Dimension: Account

Levels: Account ID

Dimension: Asset

Levels: • Asset Category
• Asset ID

Dimension: Date

Levels: • Year
• Quarter
• Month

Dimension: Entity

Levels: • Consolidated Group
• Company
• Region
• Division
• Business Unit

Dimension: Entity_Company

Levels: • Consolidated Group

- Company

Dimension: Invoice Number

Levels: • PO Number

5

Dimension: Jurisdiction_City

Levels: • Country

- State

- City

10

Dimension: Jurisdiction_Geo Code

Levels: • Country

- State

- City

15

- County

- School District

- Geo Code

Dimension: Jurisdiction_Type

20

Levels: • Country

- Jurisdiction Type

- Name

Dimension: Tax_Account ID

25

Levels: • Tax Category

- Tax Subcategory

- Account ID

- Account Description

30

Dimension: Tax_Subcategory

Levels: • Tax Category

- Tax Subcategory

Dimension: Transaction_Description

Levels: • Transaction Description

Dimension: Transaction FSC

5 Levels: • Ship To Geo Code

- Customer Ac ID

- Transaction ID

- Line Item

- Transaction Description

10

Dimension: Transaction ID

Levels: • Transaction ID

Dimension: Transaction ID_Descp

15 Levels: • Transaction ID

- Transaction Description

Dimension: Transaction Type_ID_Descp

Levels: • Transaction_Type

- Transaction ID

- Transaction Description

20

Dimension: Transaction_Line Item

Levels: • Transaction Type

- Tax Type

- Line Item

25

Dimension: Customer ID

Levels: • Customer Ac ID

- OLAP Cubes

30

Cubes

The following sets illustrate various examples of dimensions and attributes necessary to determine exemplary facts.

Cube: Adjusted Book (See Figure 9.)

5

Fact Table: adjusted_book_fact_tbl

Measure(s)

Adjusted Book Amount

10

<u>Dimension</u>	<u>Grain (attribute)</u>
Date	month
Entity	business unit
Jurisdiction_Type	country
Tax_Subcategory	sub-category

15

Cube: Apportionment Factor Comparison

Fact Table: apportionment_fact_tbl

Measure(s)

20

Apportionment Percent

Payroll Percent

Property Percent

Sales Percent

25

<u>Dimension</u>	<u>Grain</u>
Date	year
Entity_Company	business unit
Jurisdiction_Geo Code	Geo Code
Tax_Account ID	Account (Description)

30

Cube: FSC Transaction-by-Transaction Analysis

Fact Table: line_item_fact_tbl

Measure(s)

Line Item Amount

	<u>Dimension</u>	<u>Grain</u>
5	Date	month
	Entity	business unit
	Jurisdiction_Type	jurisdiction type
	Tax_Subcategory	sub-category
	Transaction_Line Item	line item
10	Transaction FSC	Tranasaction (Description)

Cube: IDR Detail Transaction AnalysisFact Table: line_item_fact_tbl15 Measure(s)

Line Item Amount

	<u>Dimension</u>	<u>Grain</u>
	Date	month
20	Entity	business unit
	Jurisdiction_City	city
	Tax_Account ID	account ID
	Transaction_Tran ID	transaction ID

25 **Cube: Payroll**Fact Table: payroll_fact_tblMeasure(s)

Payroll

30	Employee Headcount
	Employee Days
	Officer Salaries

<u>Dimension</u>	<u>Grain</u>
Date	month
Entity	business unit
Jurisdiction_City	city

5

Cube: Project Financial

Fact Table: projected_financial_fact_tbl

Measure(s)

10

Projected Book Net Income

Projected Permanent Differences

Projected Timing Differences

<u>Dimension</u>	<u>Grain</u>
Date	month
Entity	business unit
Jurisdiction_City	city

15

Cube: Project Taxable 1

20

Fact Table: projected_financial_fact_tbl

Measure(s)

Projected Book Net Income

Projected Permanent Differences

25

Projected Timing Differences

<u>Dimension</u>	<u>Grain</u>
Date	month
Entity	business unit
Jurisdiction_City	city

30

Cube: Project Taxable 2

Fact Table: schedule_m_fact_tbl

Measure(s)

Schedule M Amount

5	<u>Dimension</u>	<u>Grain</u>
	Date	month
	Entity	business unit
	Tax_Subcategory	tax subcategory

10 **Cube: Property Tax Comparison**

Fact Table: asset_fact_tbl

Measure(s)

Accumulated Depreciation

15 Assessed Value

Book Basis

Capacity

Replacement Cost

Utilization

20

	<u>Dimension</u>	<u>Grain</u>
	Asset	asset ID
	Date	month
	Entity	business unit
25	Jurisdiction_Geo Code	geo code
	Tax_Account ID	account ID

Cube: Purchase Transactions Analysis

30 Fact Table: invoice_fact_tbl

Measure(s)

Pretax Invoice

Taxes Paid

Invoice Total

DimensionGrain

Date

month

5

Entity_Company

Company

Jurisdiction_Geo Code

geo code

Account ID

account ID

Transaction ID_Decsp

Transaction Description

10

Cube: Reserve Account Transaction AnalysisFact Table: line_item_fact_tblMeasure(s)

Line Item Amount

15

DimensionGrain

Date

month

Entity

business unit

Jurisdiction_City

city

20

Tax_Account ID

account ID

Transaction Description

Transaction Description

Transaction ID

Transaction ID

Transaction Type

Transaction Type

25

Cube: Sales Tax RefundFact Table: invoice_fact_tblMeasure(s)

Invoice Total

30

Pre-tax Invoice Amount

Exempt Amount

Tax Paid

Tax Accrued

<u>Dimension</u>	<u>Grain</u>
Date	month
Entity	business unit
5 Tax_Subcategory	tax subcategory
Vendor ID	vendor ID
Invoice Number	Invoice Number

Cube: Sales Tax Refund Analysis

10

Fact Table: invoice_fact_tblMeasure(s)

Exempt Base Amount

Invoice Amount

15 Pre-tax Invoice Amount

Tax Accrued

Tax Paid

<u>Dimension</u>	<u>Grain</u>
20 Date	month
Entity	business unit
Tax_Account ID	account ID

Cube: Schedule M Comparison

25

Fact Table: schedule_m_fact_tblMeasure(s)

Schedule M Amount

30	<u>Dimension</u>	<u>Grain</u>
	Date	year
	Entity	business unit
	Tax_Sub Category	sub-category

Cube: Tax Adjustment

Fact Table: tax_adjustment_fact_tbl

Measure(s)

Tax Adjustment Amount

Dimension

Grain

Date

year

Entity

business unit

Jurisdiction_Type

jurisdiction name

Tax_Sub Category

sub-category

Cube: Tax Return Analysis

Fact Table: tax_return_fact_tbl

Measure(s)

Tax Return Amount

Dimension

Grain

Date

year

Entity

business unit

Jurisdiction_Type

jurisdiction type

Tax_Sub Category

sub-category

Cube: Three Year Schedule M Comparison

Fact Table: schedule_m_fact_table

Measure(s)

Schedule M Amount

Dimension

Grain

Date	year
Entity	business unit
Tax_Account ID	Account ID (Description)

5 **Cube: Virtual Reserve Account Tax Class**

Fact Table: line_item_fact_tbl

Measure(s)

Line Item Amount

10

Dimension

Grain

Tax_Account ID	Account ID (Description)
----------------	--------------------------

Virtual Cubes

15

Cube: Book to Tax Reconciliation

Fact Tables: tax_return_fact_tbl, schedule_m_fact_tbl, adjusted_book_fact_tbl

Measure(s)

20

tax_return_fact_tbl.Tax Return Amount

schedule_m_fact_tbl.Schedule M Amount

adjusted_book_fact_tbl.Adjusted Book Amount

tax adjustment.Tax Adjustment Amount

25

Dimension

Grain

Date	month
------	-------

Entity	business unit
--------	---------------

Jurisdiction_Type	jurisdiction type
-------------------	-------------------

Tax_Sub Category	sub-category
------------------	--------------

30

Cube: Projected Taxable Income

Fact Tables: projected_financial_fact_tbl, schedule_m_fact_tbl

Measure(s)

Projected taxable income 1. Projected Book Net Income

Projected taxable income 1. Projected Permanent Differences

Projected taxable income 1. Projected Timing Difference

5 Projected taxable income 2. Schedule M Amount

DimensionGrain

Date

month

Entity

business unit

10

Jurisdiction_City

jurisdiction type

Tax_Sub Category

sub-category

Cube: Projected Taxable Income (FIX)15 Fact Tables: Reserve Account Transaction AnalysisMeasure(s)

Reserve Account Transaction Analysis .Line Item Amount

DimensionGrain

20

Date

month

Entity

business unit

Jurisdiction_City

jurisdiction type

Tax_Account ID

Account ID (Description)

25 Although only a few embodiments of the present invention have been described in detail herein, it should be understood that the present invention may be embodied in many other specific forms without departing from the spirit or scope of the invention. Therefore, the present examples and embodiments are to be considered as illustrative and not restrictive, and the invention is not to be limited to the details given herein, but may be modified within the scope of the appended claims.

CLAIMS

What is claimed is:

- 5 1. A method for organizing and managing a transaction-related dimension of tax data for generating fact details comprising the steps of:
- (a) providing a transaction-related dimension of tax data;
- (b) providing a plurality of attributes for the transaction-related dimension of tax data, the attributes including a transaction line item determined based on attributes selected from
- 10 the group of attributes consisting of a transaction identifier, a transaction type, a tax type, a customer account identifier, a sold to location geographic code, a ship to location geographic code, a contract number, a purchase order number, a vendor account identifier, and a vendor zip code;
- (c) receiving a plurality of entries associated with the attributes of the transaction-related
- 15 dimension; and
- (d) generating a plurality of fact details by using the entries of a predetermined set of the attributes of the transaction-related dimension.
2. The method as set forth in claim 1, and further comprising the step of: providing a description of each of the attributes.
- 20 3. The method as set forth in claim 1, wherein the transaction line item is further determined based on attributes selected from the group consisting of a transaction description and a contract type.
4. The method as set forth in claim 1, and further comprising the step of: providing a description of each of the fact details.
- 25 5. The method as set forth in claim 1, wherein the transaction line item is determined based on attributes including a transaction identifier, a transaction type, a tax type, a customer account identifier, a sold to location geographic code, a ship to location geographic code, a contract number, a purchase order number, a vendor account identifier, and a vendor zip code.

6. The method as set forth in claim 1, wherein the fact details are selected from the group of fact details consisting of an adjusted book fact, a tax adjustment fact, a schedule M fact, a tax return fact, an apportionment fact, a line item fact, a transaction fact, an invoice fact, an asset fact, a payroll fact, a taxes paid fact, and a projected financial fact.

5 7. A computer program embodied on a computer readable medium for organizing and managing a transaction-related dimension of tax data for generating fact details comprising:

(a) a code segment that provides a transaction-related dimension of tax data;

(b) a code segment that provides a plurality of attributes for the transaction-related

10 dimension of tax data, the attributes including a transaction line item determined based on attributes selected from the group of attributes consisting of a transaction identifier, a transaction type, a tax type, a customer account identifier, a sold to location geographic code, a ship to location geographic code, a contract number, a purchase order number, a vendor account identifier, and a vendor zip code;

15 (c) a code segment that receives a plurality of entries associated with the attributes of the transaction-related dimension; and

(d) a code segment that generates a plurality of fact details by using the entries of a predetermined set of the attributes of the transaction-related dimension.

20 8. The computer program as set forth in claim 7, and further comprising a code segment that provides a description of each of the attributes.

9. The computer program as set forth in claim 7, wherein the transaction line item is further determined based on attributes selected from the group consisting of a transaction description and a contract type.

25 10. The computer program as set forth in claim 7, and further comprising a code segment that provides a description of each of the fact details.

11. The computer program as set forth in claim 7, wherein the transaction line item is determined based on attributes including a transaction identifier, a transaction type, a tax type, a customer account identifier, a sold to location geographic code, a ship to location

geographic code, a contract number, a purchase order number, a vendor account identifier, and a vendor zip code.

12. The computer program as set forth in claim 7, wherein the fact details are selected from the group of fact details consisting of an adjusted book fact, a tax adjustment fact, a
5 schedule M fact, a tax return fact, an apportionment fact, a line item fact, a transaction fact, an invoice fact, an asset fact, a payroll fact, a taxes paid fact, and a projected financial fact.
13. A system for organizing and managing a transaction-related dimension of tax data for generating fact details comprising:
- 10 (a) logic that provides a transaction-related dimension of tax data;
- (b) logic that provides a plurality of attributes for the transaction-related dimension of tax data, the attributes including a transaction line item determined based on attributes selected from the group of attributes consisting of a transaction identifier, a transaction
15 type, a tax type, a customer account identifier, a sold to location geographic code, a ship to location geographic code, a contract number, a purchase order number, a vendor account identifier, and a vendor zip code;
- (c) logic that receives a plurality of entries associated with the attributes of the transaction-related dimension; and
- (d) logic that generates a plurality of fact details by using the entries of a predetermined set
20 of the attributes of the transaction-related dimension.
14. The system as set forth in claim 13, and further comprising logic that provides a description of each of the attributes.
15. The system as set forth in claim 13, wherein the transaction line item is further determined based on attributes selected from the group consisting of a transaction
25 description and a contract type.
16. The system as set forth in claim 13, and further comprising logic that provides a description of each of the fact details.

17. The system as set forth in claim 13, wherein the transaction line item is determined based on attributes including a transaction identifier, a transaction type, a tax type, a customer account identifier, a sold to location geographic code, a ship to location geographic code, a contract number, a purchase order number, a vendor account identifier, and a vendor zip code.
18. The system as set forth in claim 13, wherein the fact details are selected from the group of fact details consisting of an adjusted book fact, a tax adjustment fact, a schedule M fact, a tax return fact, an apportionment fact, a line item fact, a transaction fact, an invoice fact, an asset fact, a payroll fact, a taxes paid fact, and a projected financial fact.

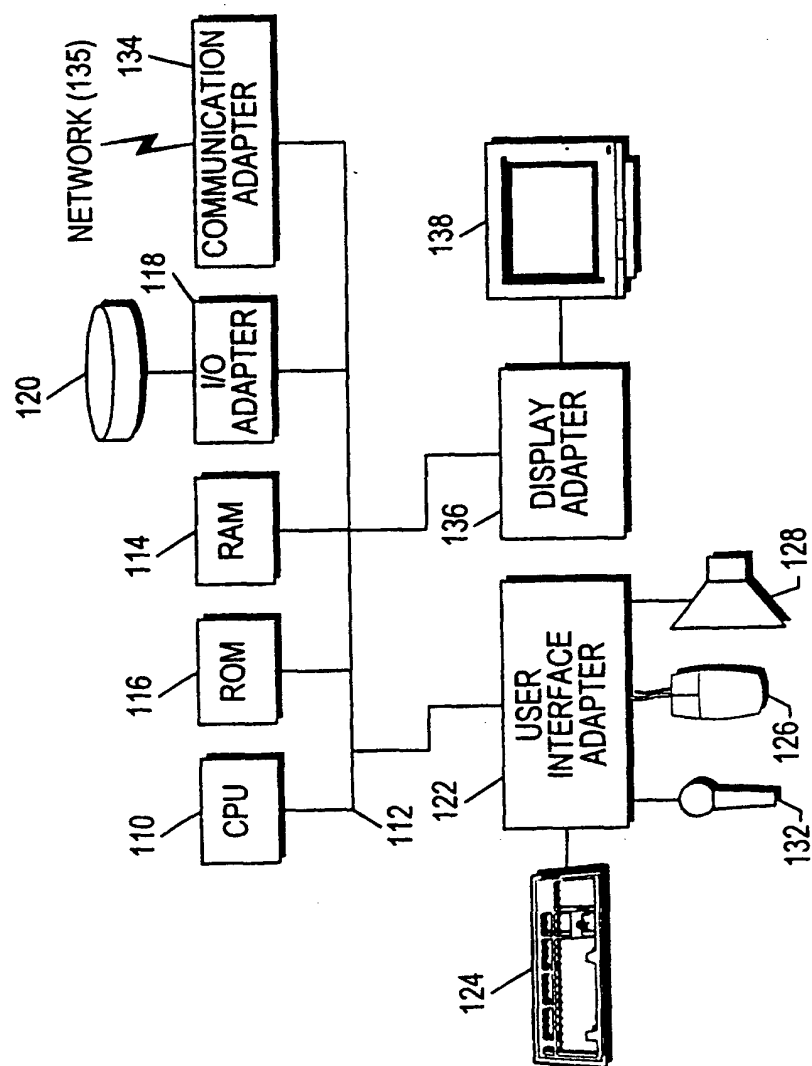


Figure 1

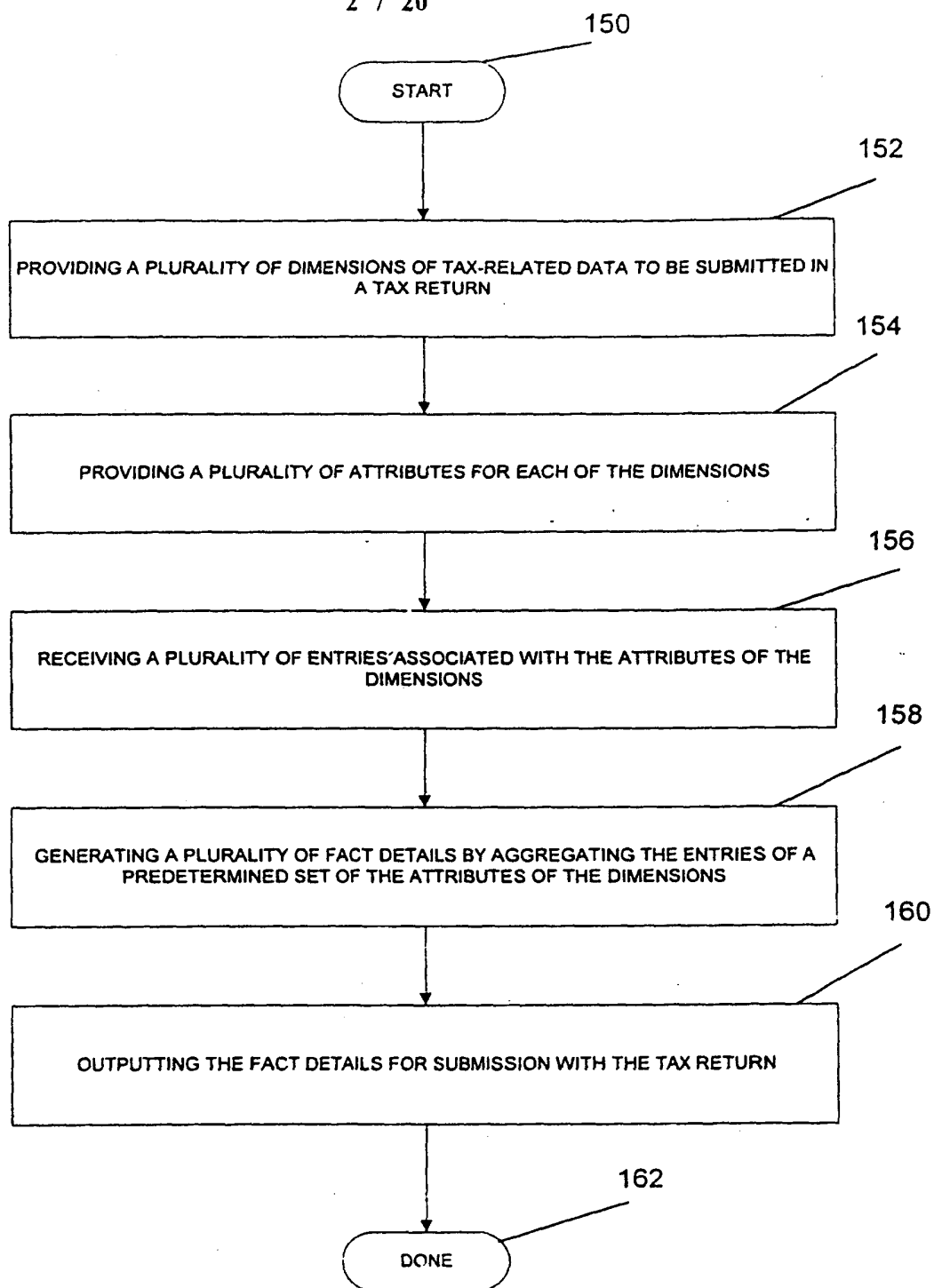
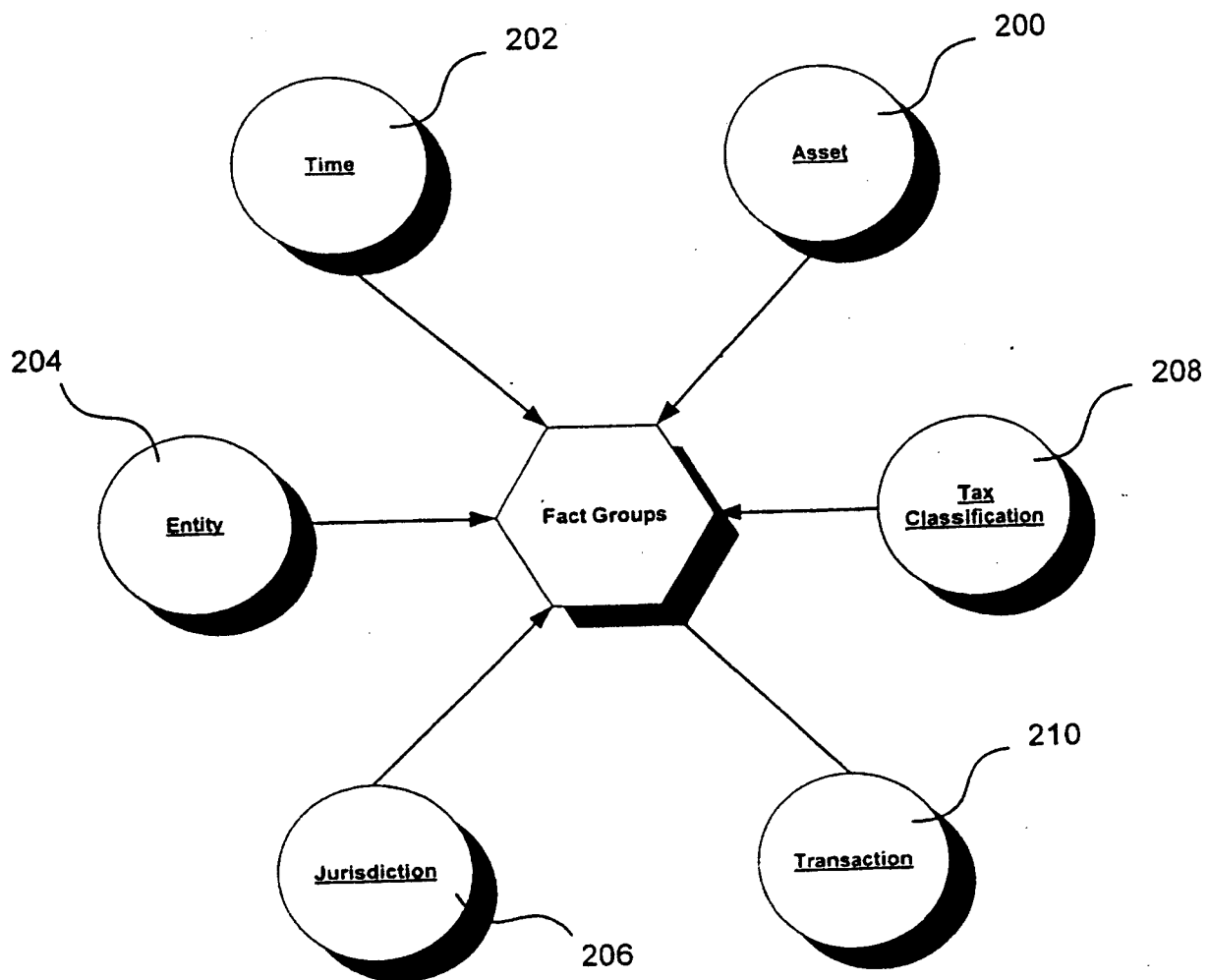


Figure 1A

**Figure 2**

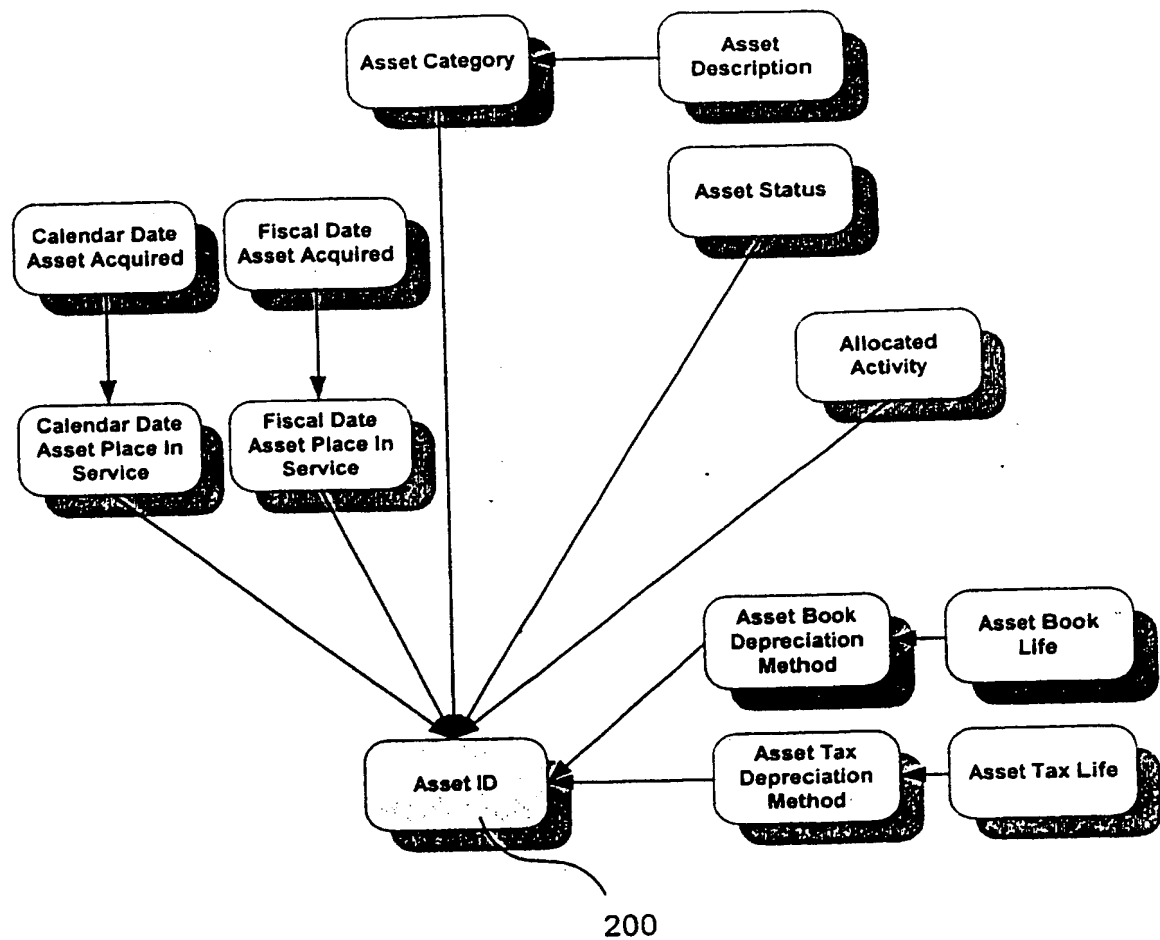


Figure 3

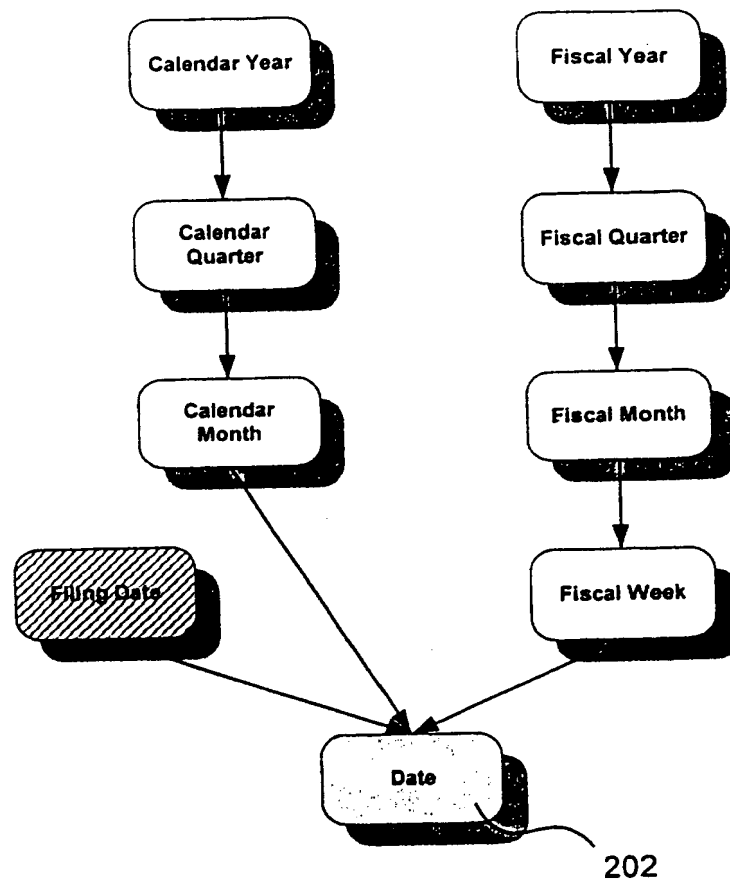


Figure 4

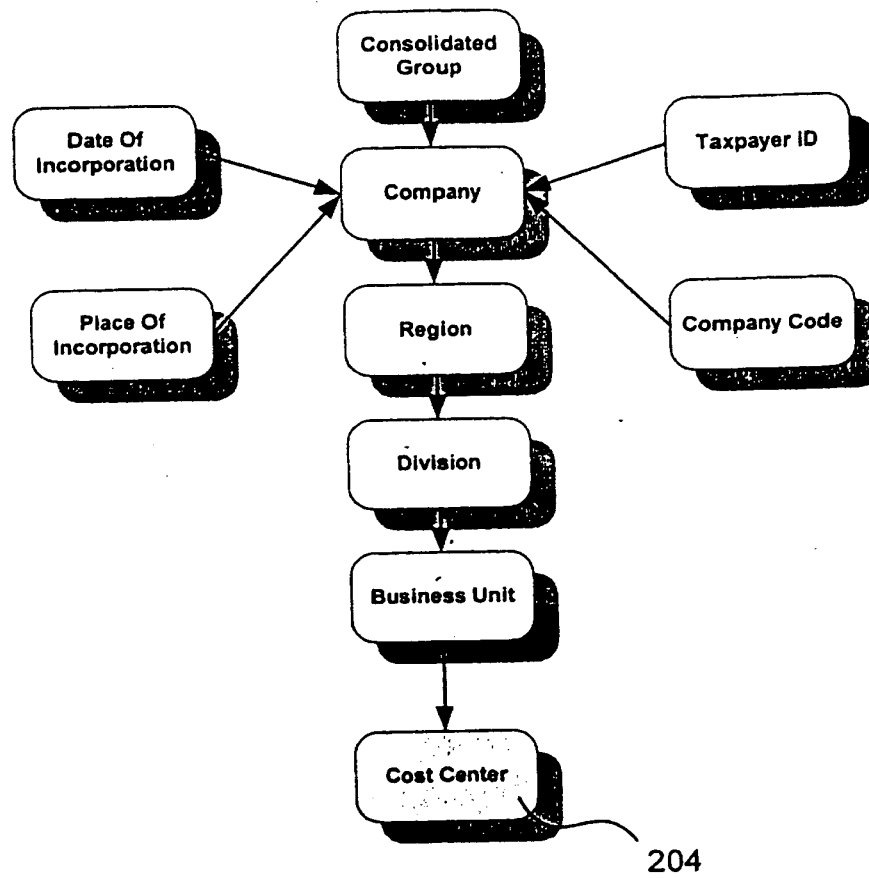


Figure 5

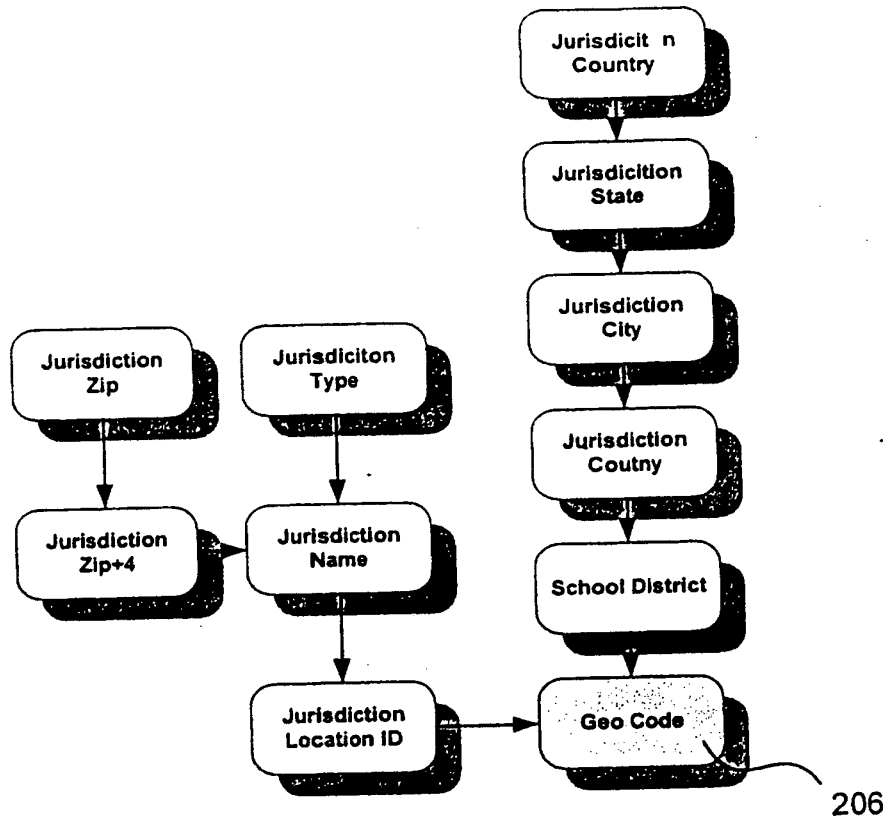


Figure 6

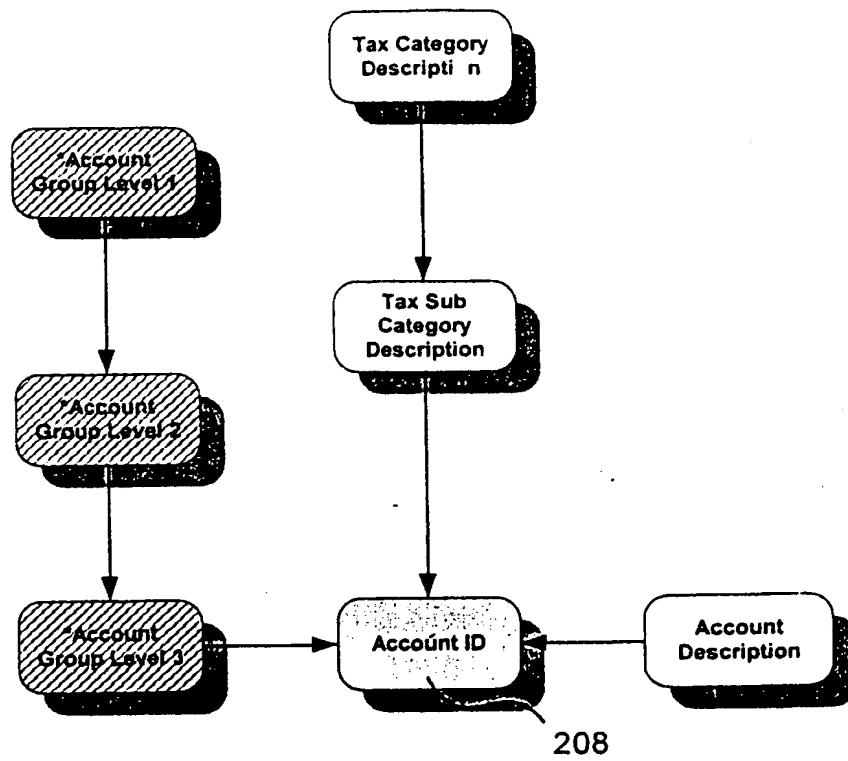


Figure 7

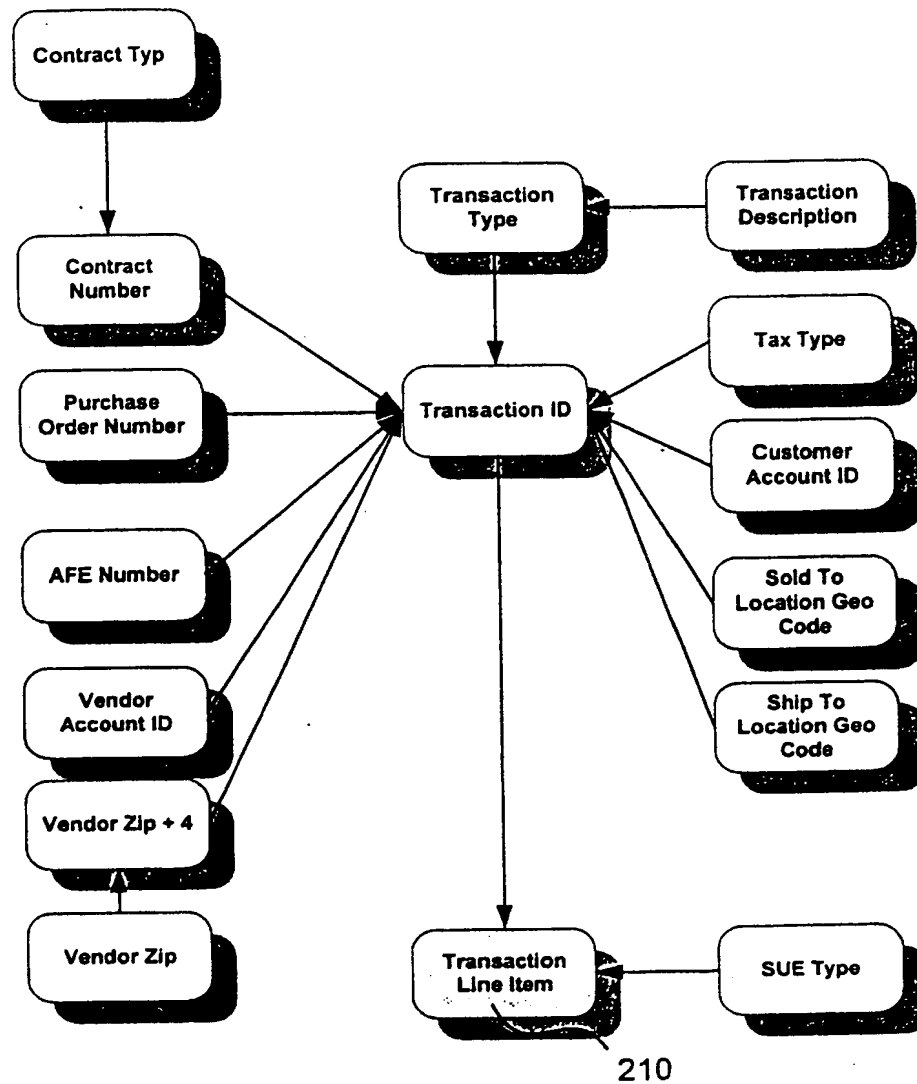


Figure 8

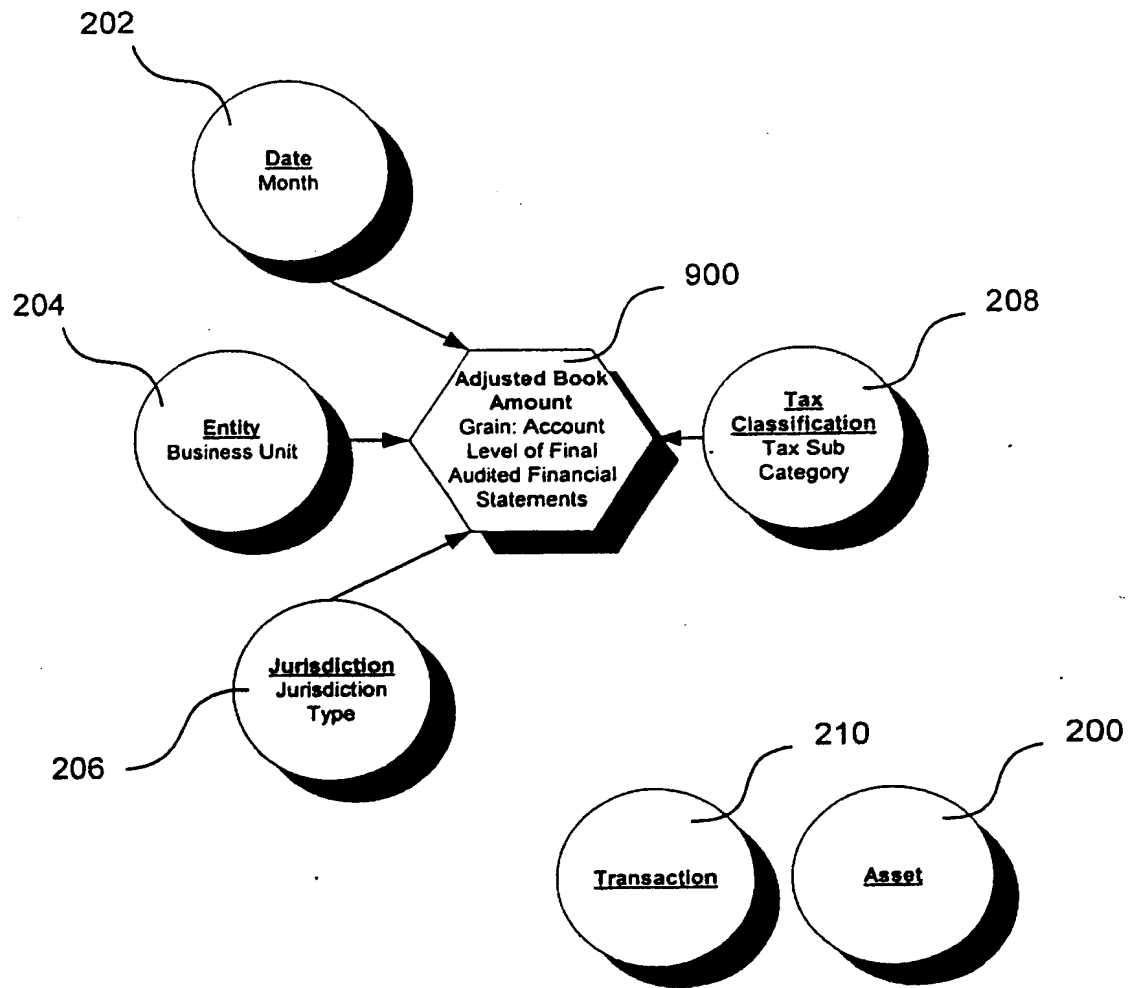


Figure 9

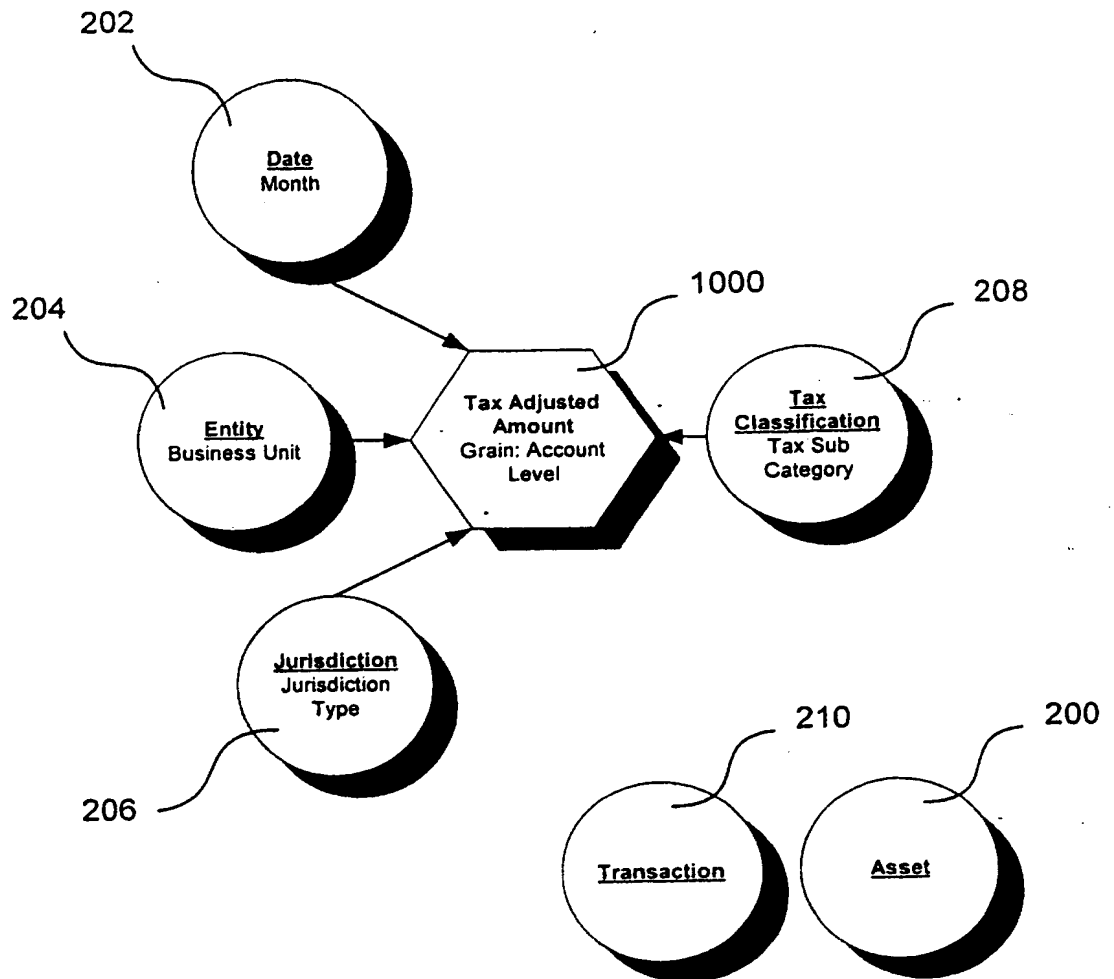


Figure 10

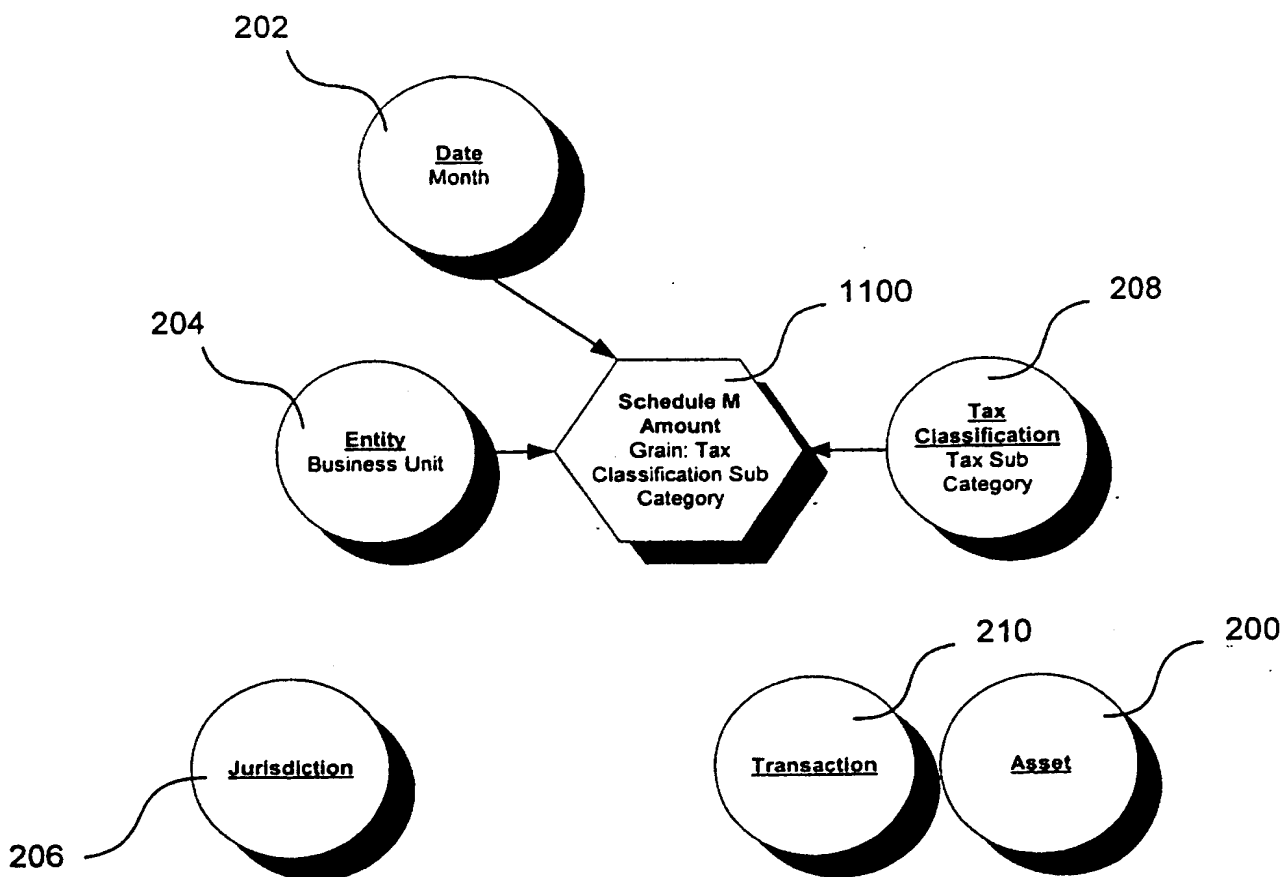


Figure 11

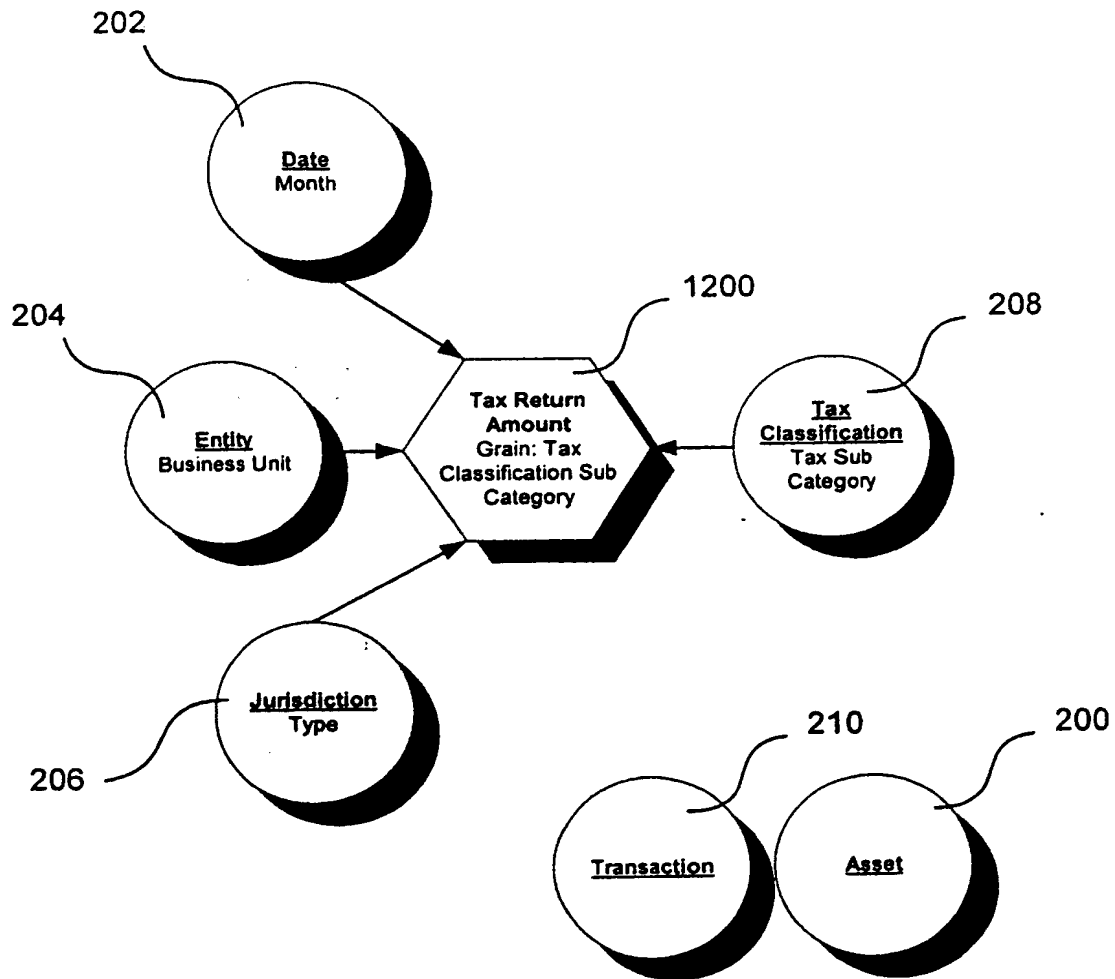


Figure 12

13/21

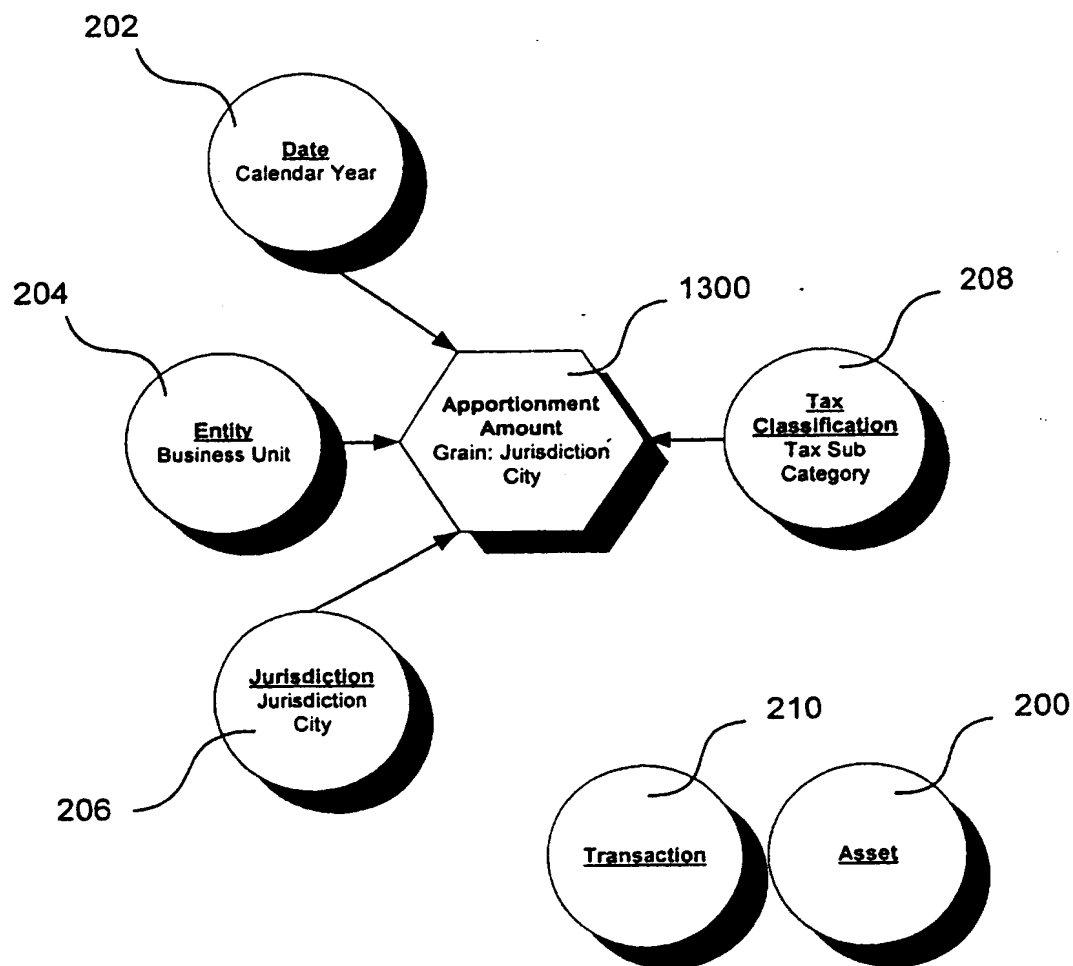


Figure 13

14/21

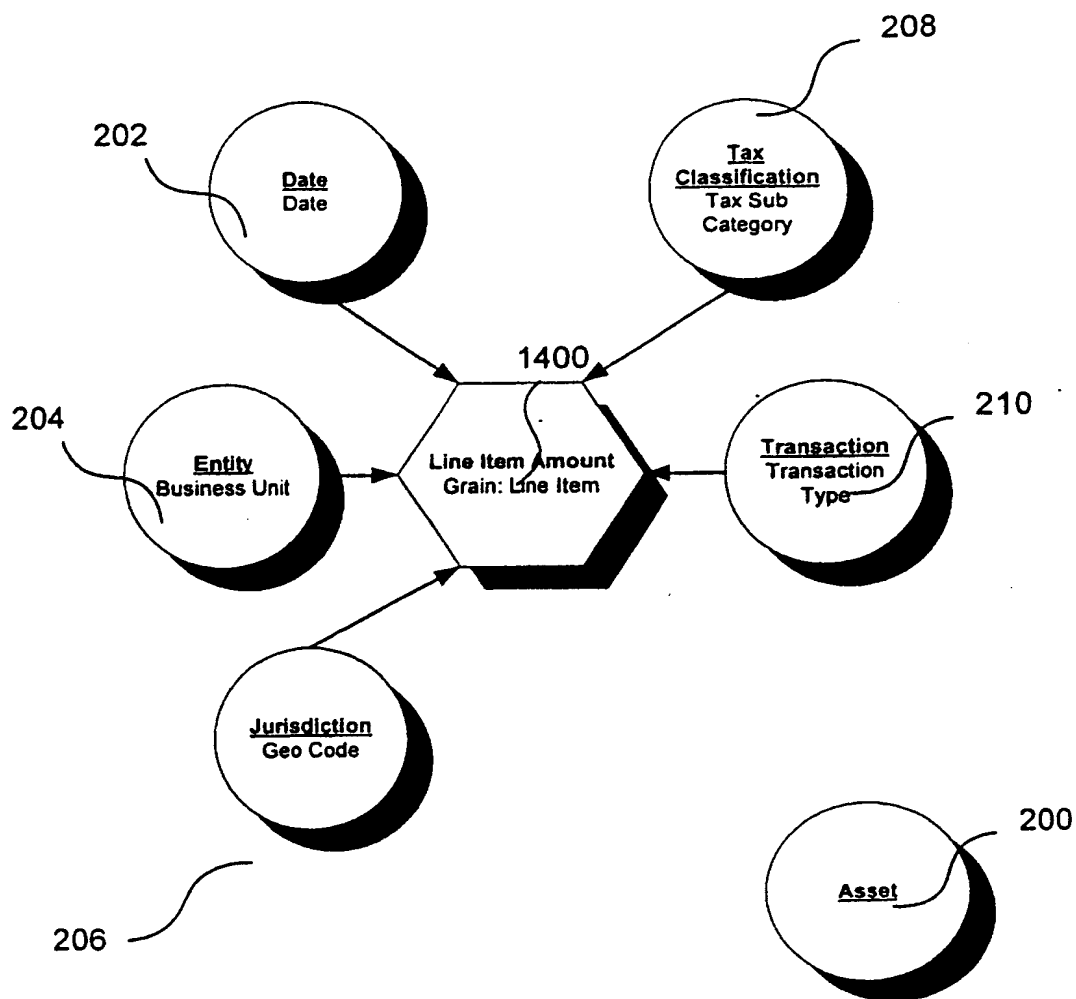


Figure 14

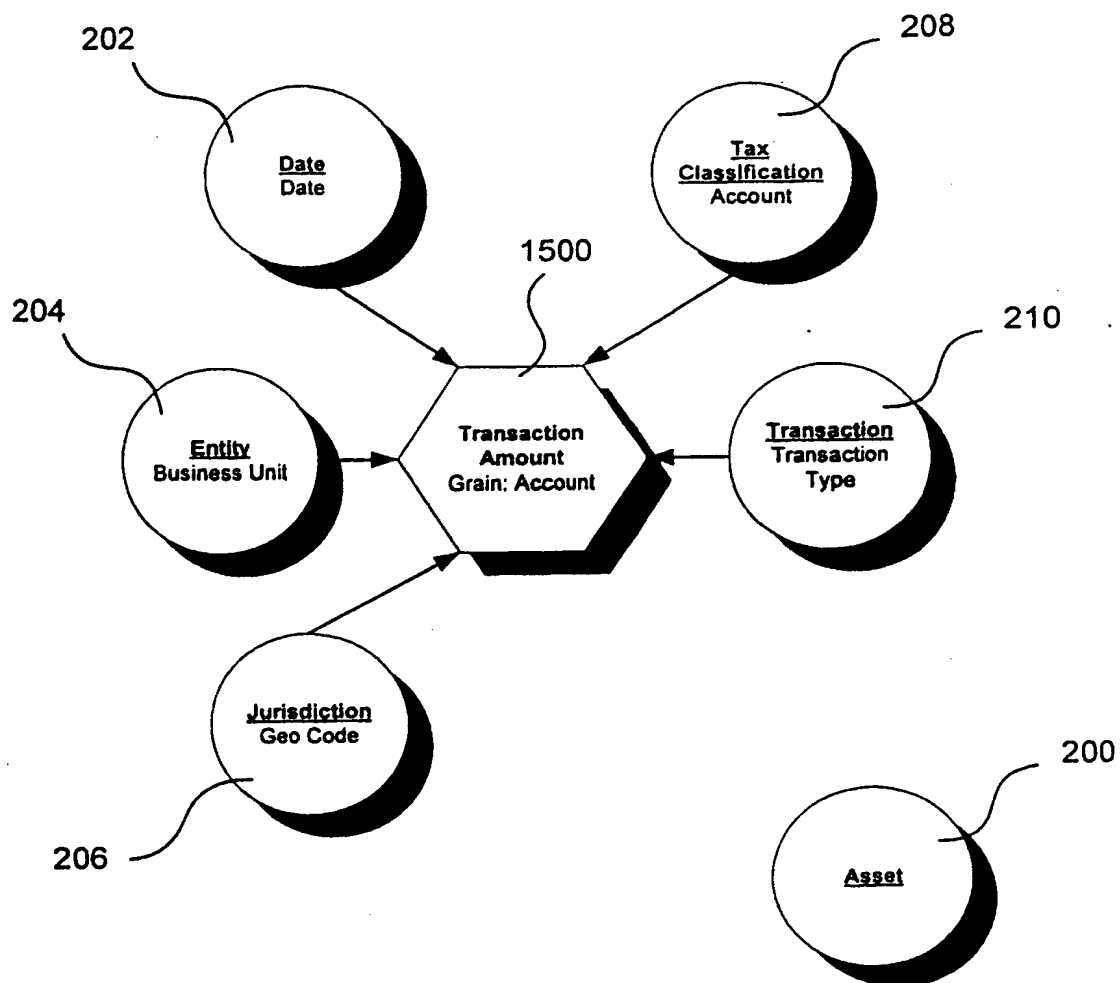


Figure 15

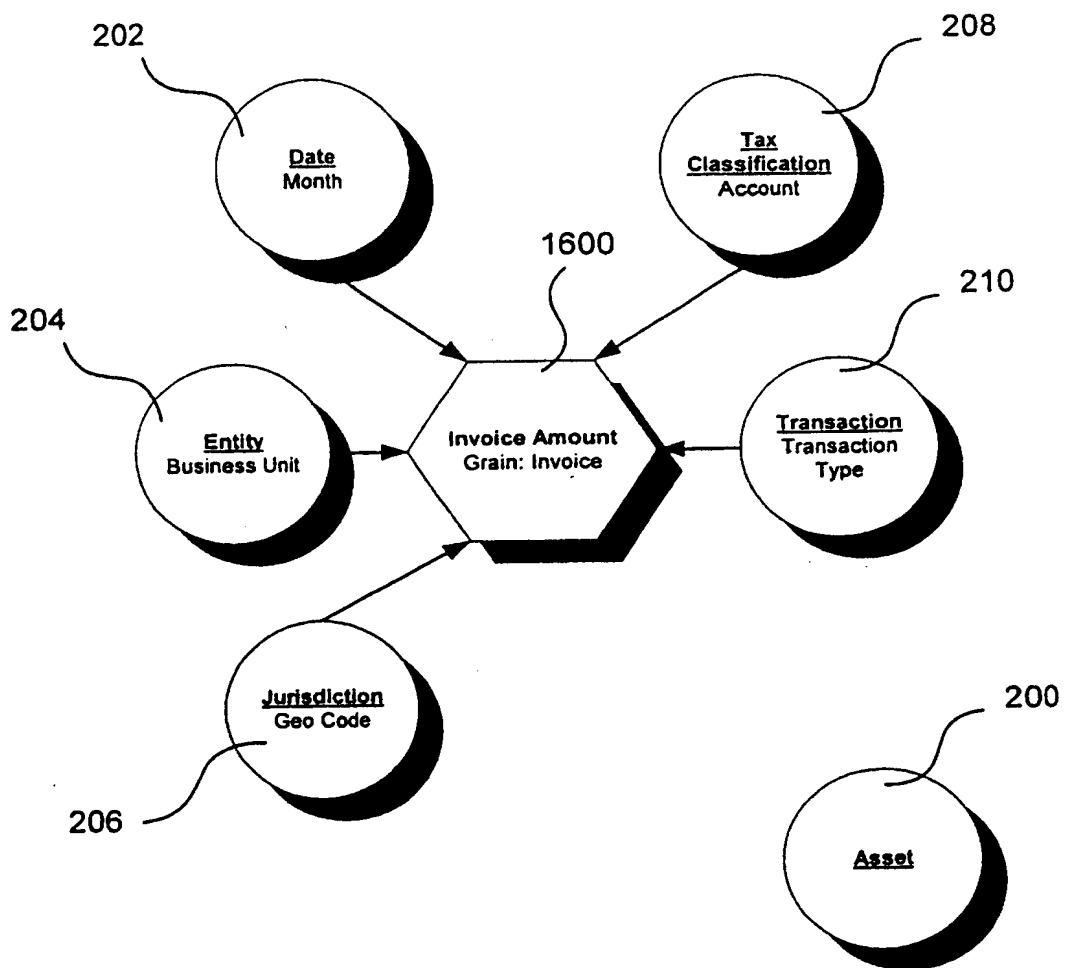


Figure 16

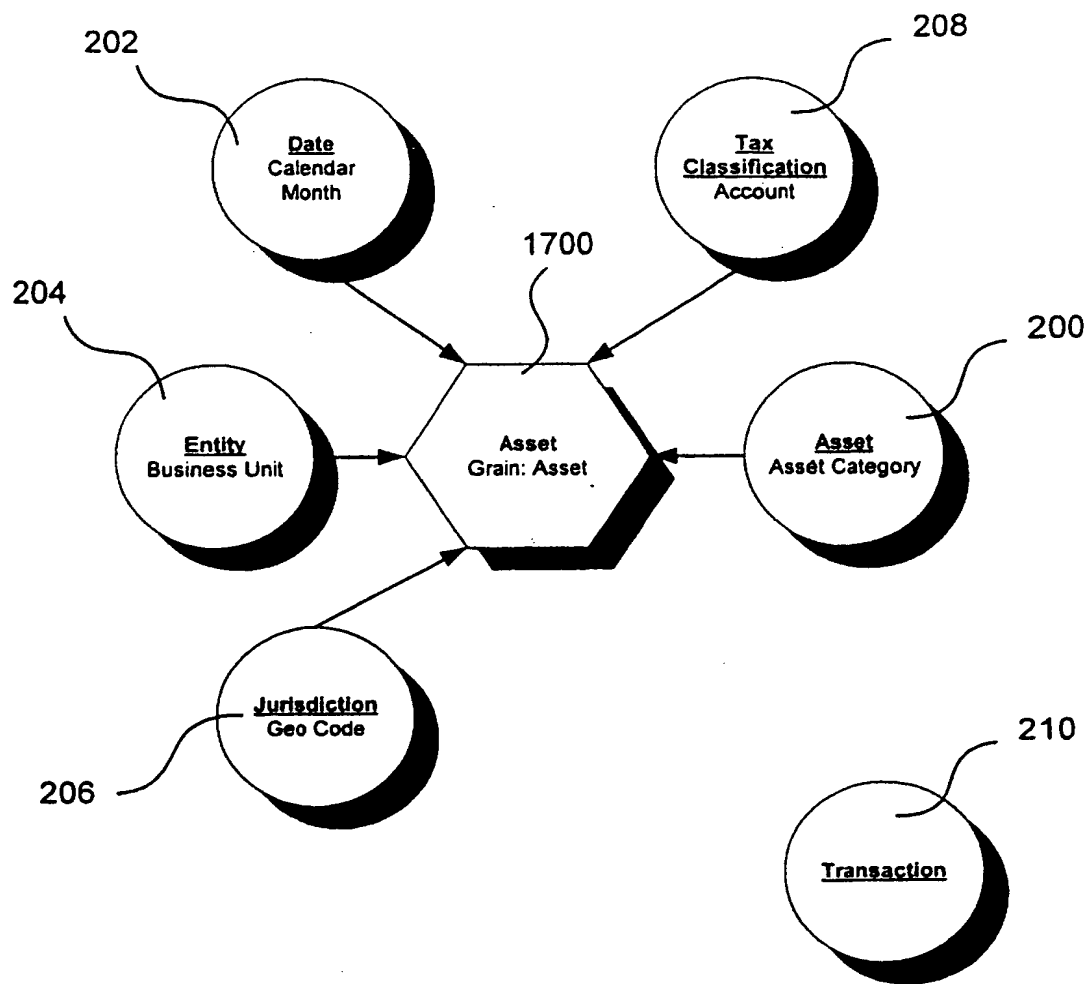


Figure 17

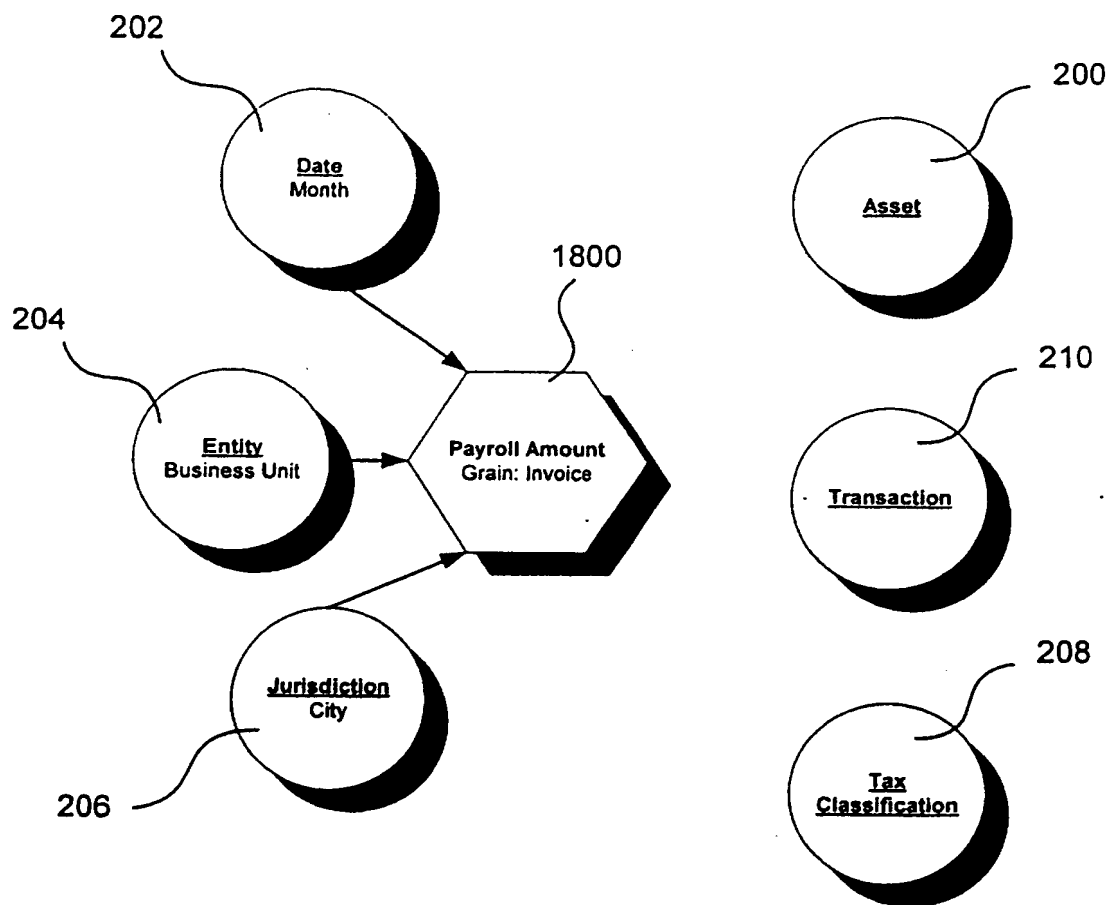


Figure 18

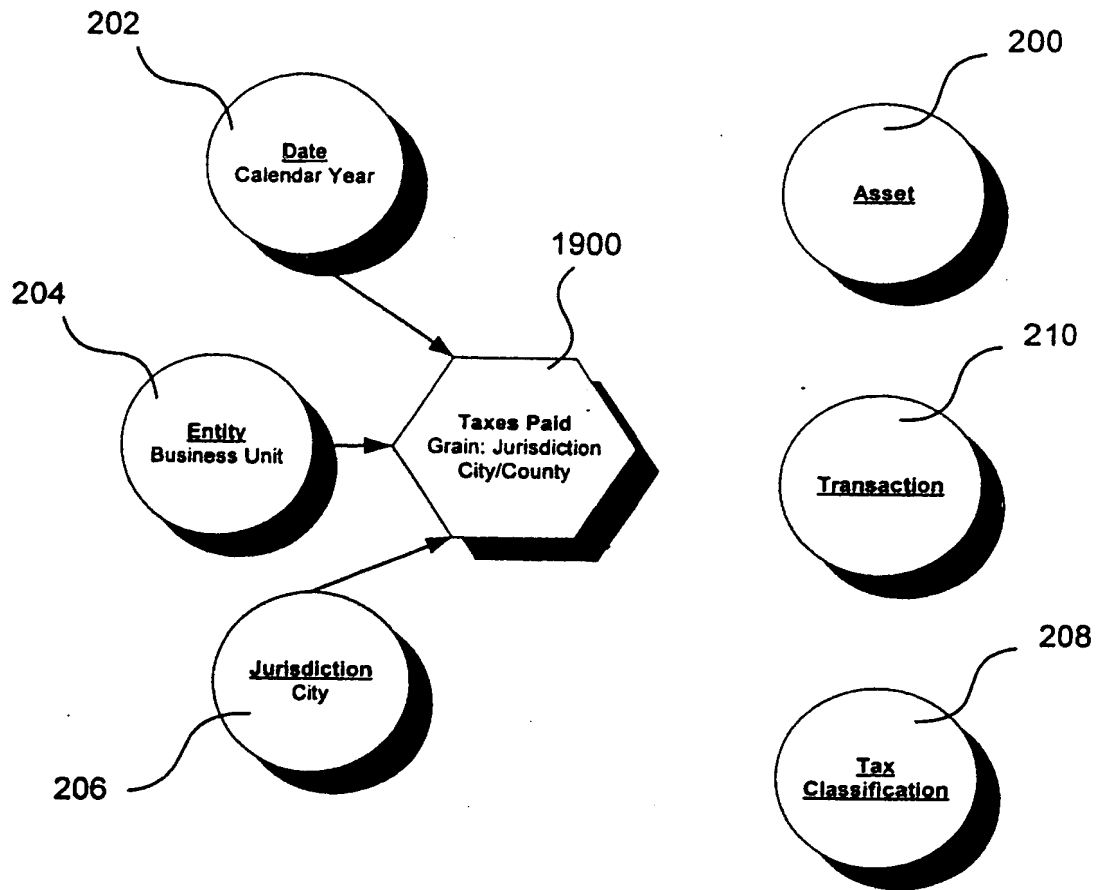


Figure 19